GITA SUTRA SAR

By

KRISHNA DHAN BANERJEE.

TRANSLATOR'S EXPLANATIONS AND NOTES

— ON —

GRAMMAR AND THEORY

OF

Hindusthani Music, as spoken of in Bengali, by above author, in his above book, Gita Sutra Sar.

By

HIMANSU SEKHAR BANERJI

TRANSLATOR'S EXPLANATIONS AND NOTES

TO

KRISHNA DHAN BANERJEE'S

GITA SUTRA SAR

VOL. II. PART II.

By

HIMANSU SEKHAR BANERJI

Explanations in English, of the Theory of Hindusthani and Ancient Indian Music, and of notations, as dealt with by the author in Vol. I of his Gita Sutra Sar, and explanations also of Notations as adopted in Vols. I and II of that book (in Bengali), with additional materials gathered by the Translator from subsequently printed and published Ancient Sanskrit Books on Music, and also from his experiments.

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PUBLISHER'S PREFACE

This "Translator's Explantions and Notes", meant for my reprint of Vol. II (my edition, the 2nd edn.), Part II of Gita Sutra Sar, was written at my request, by Babu Himansu Sekhar Banerji, for purpose of those who would not understand the theory written by the author of Gita Sutra Sar, in Vol. I, of that book, in Bengali. Previous to, and at the time of the author and amongst modern musicians trained in old methods, notation in the sense of advanced notation, as now understood in Europe was and is unknown, and besides training and teaching in some *Sârgam i.e.* Solfeggio, there was practically no music written in notation. then, and practically all music, including Raga music then, passed from, and were learnt and taught *viva-voce*, from mouth to mouth and ear to ear.

The author and some of his contemporaries, were the pioneer workers, of India, who understood and wrote about theory of Indian music, and recorded, got printed and published, high class Hindusthani Râga music, in notation. The theory as dealt with by these contemporaries of the author however, were generally antiquated, and therefore puzzling, and not consistent with the then prevalent practical music, and the notation of them also, were very elementary, having practically no signs for minute subdivisional time-values, and for accent, force, legato &c., and the writing in notation of theirs, of music, as actually performed were generally mere skeletons and often in many parts not proper representations of, that original music. In the matter of theory, of Indian Music, in the sense of it as understood by English educated people and those acquainted with the science of acoustics of musical sounds, and in the knowledge of advanced notation, and proficiency in properly writing high class performed music of Râgas in such notation, *e.g.* Staff and Tonic Sol-fa notation, the author excelled his contemporaries, and was the only one amongst them who had proper knowledge of such theory of Indian Music, and at the same time of such notation. The author, in such theory, wrote the theory of Hindusthani music in Vol. I of Gita Sutra Sar, including those for notes, *grâma*, *mâtrâs* and *padas* of *Tâls*, Râgas, *Thâts* and proper time for performance of Râga &c., and of the staff notation, and of the Tonic Sol-fa notation in Bengali, as adopted by him, and also ancient theories, as far as he could gather from printed and published ancient Sanskrit books on music, available at his time, about,—*sruti*, *grâma*. *moorchhanâ*, *Tâna*, *graha*, *ansa*, *nyâsa*, *vâdi*, *samvâdi* &c.. The author, and his contemporaries of Bengal, dealt with Hindusthâni music only, which type only, as distinct from Southern Indian, or Karnatic music, was, besides some provincial and local music, then, and is still prevalent in Bengal. From that prevalent Hindusthâni music, current at his times, which as already said was not in notation, but passed from mouth to mouth and ear to ear, the author selected and wrote in staff-notation and also in his Bengali Tonic Sol-fa notation, the music, of some songs for beginners, and also, of high class Râga songs with music, as composed *vivâ-voce* by celebrated Indian musicians, of former times such as Tânsen, Suradas, Navalkisor, Sadârang, Maulâdâd, Miâbaksu, Anandakisore, Guru Mataso, Aliâs, Miân Shori, &c., in Dhrupad, Kheyal and Tappâ types, as actually song at his times, (by passing from mouth to mouth, without any written forms of theirs, in notation), by famous Indian singers. By selecting the very gems of such songs, he included these with their music, including examples of variations of some, in staff-notation, and of some in his adapted Bengali Tonic Sol-fa notation, in Gita Sutra Sar Vol. II. Besides these, in the 1st portion of that Vol. II, the author gave, with some portions similar to above, in staff, and some in Bengali Tonic Sol-fa notation, practical exercises and lessons, including Songs for Beginners, and also some Chorus Songs with harmonised music.

The author published, the 1st edition of Vol. I of Gita Sutra Sar in 1885 (1292 B,S.) and the 2nd edition of it in 1897 (1303 B.S.). He published Vol. II of this Gita Sutra Sar in 1886 (1293 B.S.) and that was his only edition of it. Both these Volumes were in Bengali language. About 16 years after the death (in 1904 A.D., 1310 B.S.) of the author, both these volumes became out of print, and there was a great demand for both amongst educated musicians. A few years later I took up the printing, at first of Vol. I, *i.e.* of 3rd edition of it, and thereafter of Vol. II, *i.e.* of the 2nd edition of it. I began to reprint both, as they were in author's previous editions, with some up-to-date explanatory notes of mine, in Vol, I. While the priting of both, in this manner, had somewhat progressed, it was noticed that a few ancient Sanskrit books on music, had been printed and published after the death of the author of G.S.S., and some were still being published in course of my reprint, from which books, much of what the author wrote in G.S.S. Vol. I, about theories of ancient Indian music, about *sruti*, *grâma*, *moorchhanâ*, *graha*, *vâdi*, *samvâdi* &c., could find support, and new light on them, could also be thrown from these ancient books. At my request, my friend, Babu Himansu Sekhar Banerji B.A.B.L., pleader, Judge's Court, Berhampore, Bengal, District Murshidabad, undertook to write in a *Parisishta*, (*i.e.* supplement), in Bengali, to Vol. I, some of the materials gathered from these published Sanskrit books, and for facility of those who would not understand Bengali, in which language, was written the theory, as well as explanations of notation, in Vols. I and II, and also for explaining the special and additional signs introduced, suiting Indian music, in the staff notation by the author in Vols. I and II he undertook to write this "Translator's Explanations And Notes," in English. He, at first thought that that *Parisishta* and this "Translator's Explanations And Notes" would, each be completed in a few pages, and with this view, he began to write both, without dividing the latter with Chapter Numbers, and in course of that writing, both were being printed along with Vols. I and II of Gita Sutra Sar.

After the reprinting of Vol. I, and the first portion of Vol. II, mainly as these were in the author's previous editions, as spoken above, had materially progressed, it was thought that for facility of those, who would not understand Bengali, it would be better to introduce headings, explanations, and notes in Hindi, and English, together with Bengali, and to print all music, including those, which in the author's edition, was in Bengali Tonic Sol-fa notation, in staff-notation. With this view, I, mainly, at the suggestion,

and with the help and translations of, my abovementioned friend, continued to print the 1st portion of Vol. II, as that was in the author's original edition, with a view to publish the same as Part 1 of Vol. II, and began to print, the subsequent *i.e. Ostadi* songs portion, of Vol. II, containing Dhrupad, Kheyâl and Tappâ types of songs, with music, in staff-notation only (by transposing for that purpose, in staff-notation, those portions of these music, which in the author's original edition were not in staff, but in Bengali Tonic Sol-fa notation), and with headings, notes &c. in three languages *viz.* English, Hindi, together with the Bengali of the original, and with the words of songs in Devanâgar (Sanskrit) types together with those in Bengali, as in the original. This latter portion was intended to be published as Part II of Vol. II.

Together with the printing in this manner of Vol. 1, and Vol. II, Parts 1, and II, the Parisishta and Translator's Explanation And Notes also were being written and printed. Due to shortage of staff-notation types in Calcutta, and of difficulty of printing, in three languages, mentioned above, the printing of these took several years, and in course of that, due to ancient Indian musical theories on *sruti, grâma, graha, vâdi, samvâdi* &c. being misunderstood, misinterpreted and misapplied in modern Indian music, by modern, both English and Indian writers, in daily newspapers and monthly magazines, and also in books, and also due to getting of fresh materials from published ancient Sanskrit books, either printed, or very recently printed, and collected in the mean time, both the *Parisishta* and Translator's Explanations And Notes, being written by Babu Himansu Sekhar Banerji, gradually grew in size. In this manner, while the priting of some portions of Translator's Explanations And Notes, had already advanced, without division, as mentioned before, into specific Chapter Numbers, though afterwards such division and numbering of Chapters was much desired, and it was regretted for that not having been previously done, that could not be done afterwards.

Continuing to print in this manner, Vols. I and II, and also in course of being written, the *Parisishta* and Translator's Explanations And Notes, I, after completing the printing of Vol. I and thereafter of Vol, II, Part I, published Gita Sutra Sar Vol. I, 3rd edition with its *Parisishta*, and attached to the same, Vol. II, 2nd edition Part I, in 1934 (1341 B. S.). Up to that time, the printing in abovementioned three languages, and in staff-notation only, of Vol. II, Part II had not advanced more than 100 pages. As the cost and time taken for printing that had become inordinately high, in order to minimise costs and time, I got printed, from pages 102 to 117 of it in three languages, as before, but the music portion of that (as mentioned at the footnote of p. 102 of Vol. II, Part II, music portion) I partly printed in staff and partly in Bengali, English and Hindi Tonic Sol-fa notations, and as the costs and time taken in that also, had become enormous, I printed pages 118 to the end (as mentioned at foot-note to p. 118 of the music portion) of Vol. II, Part II, in two languages, *viz.* Bengali and English and the music, partly in staff and partly in Bengali Tonic Sol-fa notation, as these music had been in the author's edition. In this manner, when the printing of that Vol. II, Part II was completed, the printing and (due to fresh materials from recently printed and published ancient Sanskrit books on music, and from other sources, having been received) the writing of the Translator's Explanations And Notes had not been completed. As there was demand from a long time of educated Indian musicians, for Vol. II, containing practical high class music I, without waiting for completion of this Translator's Explanations And Notes, published, without the same, some advance copies of the music portion of Vol. II, Part II, in 1939 (1346 B.S.). The writing and printing of Translator's Explanations And Notes has now been completed, and for facility of those who may want it separately, and also of those, who after buying abovementioned advance copies of Vol. II, Part II, may wish to have this Translator's Explanations And Notes separately, I am publishing some advance copies of this Translator's Explanation And Notes, separately. Together with that and the music portion, the complete Gita Sutra Sar Vol. II, 2nd edn., Part II, with Translator's Explanations And Notes, would soon be published.

3/1 Nilmani Sarkar Lane
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September, 1941 A.D.
(1348 B.S.)

PUBLISHER

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Translator's Explanations and Notes

About The Methods Adopted For Recording His Musics In Staff-notation By The Author, Krishna Dhan Banerji, In His Gita Sutra Sar, Vol. II.

Modes and Scales.

The scales used in the practical examples of music in the Gita Sutra Sar, are natural scales, as opposed to tempered scales. It should be distinctly understood that the staff-notation, with its clefs, signatures &c. as adopted by the author of the Gita Sutra Sar, and used throughout his book,* is meant to represent just intervals. This may be objected to by Indian theorists, as not depicting the true niceties of intervals of Indian Music. These objections have been dealt with by the author in Vol. 1 of his book containing the theory portion.† Europeans, accustomed to understand the staff-notation as depicting tempered scales, may also take exception to the author's novel method of using this notation for natural scales. In explaining the author's practical examples of music, however, we are not concerned with what ought to be the intervals, according to Indian or European theory, but with what they were actually meant to be, by the author. This I shall attempt to explain.

It should, in the first instance, be borne in mind that proper intonation, *i.e.* sounding the correct pitch of the tones is of more importance in Indian Music than in the European system. In the harmony of European Music, slight inaccuracies in the sounding of individual tones may be masked by the sounds of tones of the several other parts. Indian Music, however, both vocal and instrumental, is principally of the monodic type, and a slight departure made, while playing, from the proper pitches of tones, (especially those tones which are said to be the very lives and souls of a melody), may spoil the music. The author has distinctly said (Gita Sutra Sar Vol. 1, ch. 1 p. 25) that "Indian Music cannot be properly played in the artificial intervals of equal temperament of the European pianoforte, harmonium &c. instruments. Played in these instruments, Indian melodies will not be agreeably in tune, but will be deficient in richness, and will appear insipid and inartistic". In reproducing his written musics, the intervals, therefore, should be taken as those intended by the author, viz. natural intervals.

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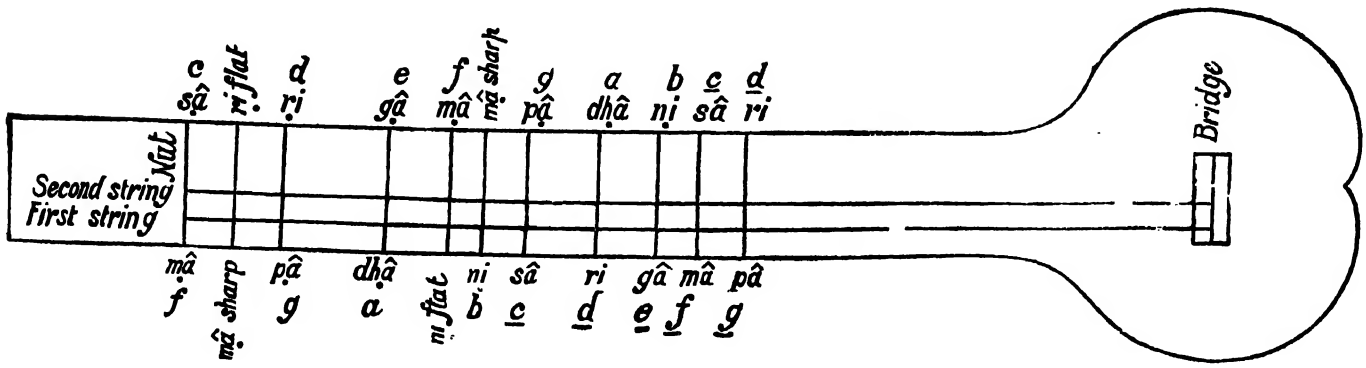
* Except in the pianoforte parts, especially composed by the author in some of his musics preceding his "*Dhrupad*" songs, to give Indian Musicians an idea of European harmony.

† Both the volumes were written and published by the author in Bengali.

In order to understand how these intervals are kept in accompanying instruments, and also in solo playing, let us first explain the method of tuning of Indian stringed instruments either with fixed frets such as the *Vinâ*, or with movable frets, such as the *Indian Sitâr*, *Esrâj* &c.



The above figure shows the nature of tuning of these instruments. The full numbers of strings, and frets as actually used, have not been shown in the figure.

The second string, (generally of brass,) is tuned to the *sâ* (*c*) of the lower octave of the singer's voice. The first string, (generally of steel,) is tuned to the upper fourth of the second string, *i. e.* to the lower *mâ* (*f*) of the singers' voice. This tuning, and the arrangement of the frets, (for the standard scale) as shown in the figure, is generally prevalent in Hindustan, especially in Bengal. The same frets serve the purpose of both the strings. The frets give the following tones :—

2nd string—lower sâ upwards as—sâ, ri flat, ri, gâ, mâ, mâsharp, pâ, dhâ, ni, sâ, ri, &c.

c, d♭, d, e, f, f♯, g, a, b, c, d, &c.

1st string from lower mâ upwards as—mâ, mâsharp, pâ, dhâ, niflat, ni, sâ, ri, gâ, mâ, pâ &c.

f, f♯, g, a, b♭, b, c, d, e, f, g &c.

The Bengali method has been followed in placing dots below notes to indicate the lower octave, and the European system has been followed in placing dashes below the English (equivalent) names of notes, to indicate the middle octave. In India, the intervals, theoretically, are just (natural) intervals. The values of these intervals, and their slight departure, in some cases, in practice, from theory, will be dealt with later on.

Some Indian melodies are played in the standard *Thât* (ঠাট) or mode (*i. e.* method of arrangement of the frets giving a particular series of tones), as given above. Other melodies require different *Thâts* or modes for which the frets are required to be shifted. For example, in *Râgini Bhâirabi* (of Bengal), *ri*, *gâ*, *dhâ*, and *ni*, (d, e, a, and b) are all flats, and to play it, some frets are shifted from their standard positions shown above, to the proper positions, where they will give these required flat tones.* Besides the above method of tuning, to suit different melodies, in which the pitches of the open strings remain unaltered, there is another method, in which, the pitches of the open strings are changed to fit the voices of different singers. For example, when one singer is followed by another, whose voice is higher or lower in pitch, to that of the former, the tones of the open strings are altered to the lower *sâ* and *mâ* of this new singer's voice. Suppose, the middle *sâ* of this new singer is sharper by one tone to that of the former, *i. e.* the middle *sâ*(*c*) of the latter is the same as the *ri*(*d*) of the former. To accompany this new singer, the second string is tuned to the lower *ri* (*d*) of the former player, and the 1st string

*This method of tuning by shifting of the frets, has given rise to a great number of *Thâts* or modes for Indian Music. Rajah Saurindra Mohan Tagore and his School in Bengal, have recorded more than one hundred and fifty of them. Krishna Dhan Banerji (the author of the Gita Sutra Sar) has, by transposition, considerably reduced the number of these modes. This he has also practically exemplified in his musics.

to its upper fourth, and the instrument is said to be tuned to the lower *sâ*(*c*), and *mâ*(*f*) of the new singer * The frets, unaltered, give *ri*, *gâ*, *mâ*, *pâ* &c. of the new singer. Thus in this transposition, by changing the tunes of the open strings, the tonal relationship of the altered tones remains the same *i.e.* just natural intervals.

The author of the Gita Sutra Sar has kept up this tonal relationship of just (natural) intervals in adopting the staff-notation for Indian purposes. In the European system, the 'notes' represent fixed pitches, and they take their names from their positions on the staff (and from the clefs and accidentals.) In the staff-notation as adopted in the Gita Sutra Sar, a note, though occupying the same position on the staff, (and bearing the same accidental) and having the same name, may denote slightly different tones in different keys. This will be dealt with later on.

Tones and Notes.—I have intentionally kept up the distinction between the words **tone** and **note**. By **tone** is meant a musical sound of definite pitch; a **note** is meant for a character, or sign written on the staff to show—high, medium, low—the exact pitch of the tone or sound it represents. In staff-notation the "notes" take their names from the lines or spaces which they occupy on the staff.

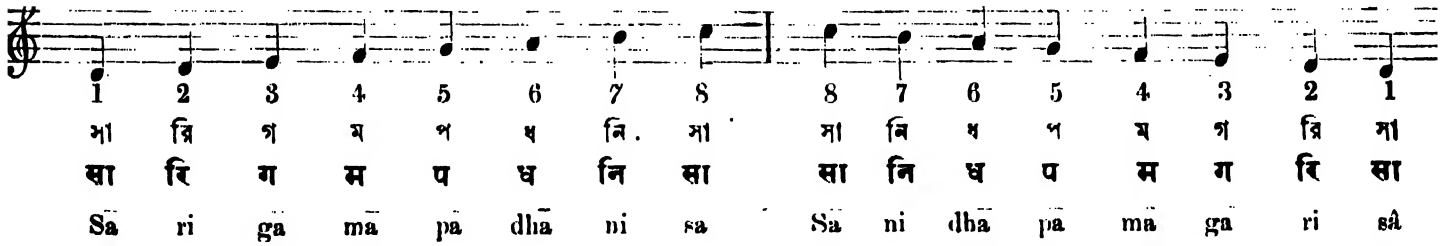
It has already been said that strings of Indian instruments, are tuned to suit each individual Indian singer, or instrument player. The middle '*c*' (*sâ*), thus varies in pitch in different musicians. To suit this peculiarity of India, Indian Music, according to the author, may be written in the staff-notation in two different ways :—

(1) The music may be written in the key of '*c*' and the value of this '*c*' given in the heading. The author has in many cases adopted this method, and has depicted in the heading the value of the *c*, as *mâ* kharaj, or *gâb* kharaj, etc. The author means by this, that the music may be conveniently sung in the key† of '*f*' or '*eb*' &c, and thereby very high or very low tones for the voice may be avoided.

(2) Music may also be written by transposing the notes in the key in which it is intended to be sung or accompanied. In the Gita Sutra Sar some musics have also been written in this method.

Let us now exemplify the scales in different keys as given in the Gita Sutra Sar.

Standard Scale



* In Europe, strings of open-stringed instruments, and instruments with key-boards, are tuned in some fixed pitches. There is no such fixed standard of pitch for India. "The Musicians of Hindoostan never appear to have had any determined pitch by which their instruments were regulated, each person tuning his own to a certain height, adapted by guess, to the power of the instrument and quality of the strings, the capacity of the voice intended to be accompanied, and other adventitious circumstances." (Treatise on the Music of Hindoostan by Capt. Willard—article—Of the Gamut.) As good musics of India, whether vocal or instrumental, consist principally of solos, this absence of a standardized pitch does not materially affect them. It does not matter therefore, as to which note of the European middle octave is designated by either *sâ* or *ri* &c. of the Indian system, and also as to which particular pitch, or note of the European system is adopted for the middle *sâ* (*c*) of the singer, or of the instrument.

† In the method of tuning of Indian instruments as followed by the author, and already explained, keys have a slightly different meaning from that of the European system. The tones of notes in different Indian keys, (as adopted by the author,) may alter a little. This has been explained later on. In adopting these keys, the author means that the '*c*' of the middle octave is to be taken as equivalent to the middle *c* of some European system.

Change of keys | **গ্রামের স্বরজ পরিবর্ত্তন।** * | **গামকা স্বরজ পরিবর্ত্তন।**

Natural scale in the key of G. | প-স্বরজের গ্রাম। | प स्वरजका ग्राम।

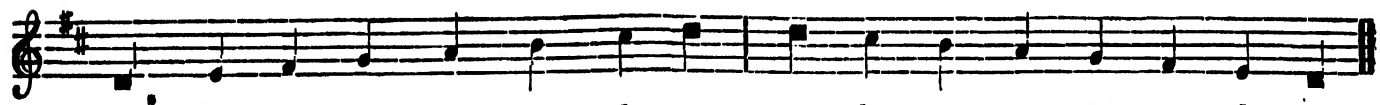
সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা

सा रि ग म प ध नि सा सा नि ध प म ग रि सा

Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

The flattened sign Indicates the key-note.

Natural Scale in the key of D. | রি স্বরজের গ্রাম। | रि स्वरजका ग्राम।

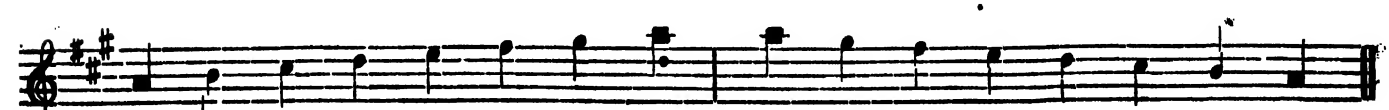


সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা

सा रि ग म प ध नि सा सा नि ध प म ग रि सा

Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

Natural Scale in the key of A. | ধ স্বরজের গ্রাম। | ध स्वरजका ग्राम।



সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা

सा रि ग म प ध नि सा सा नि ध प म ग रि सा

Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

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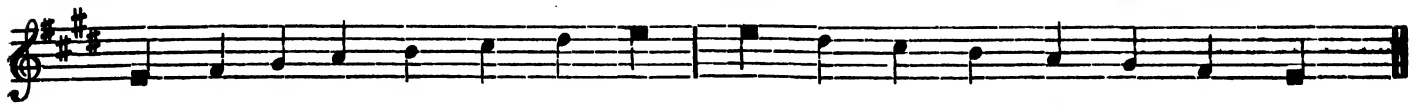
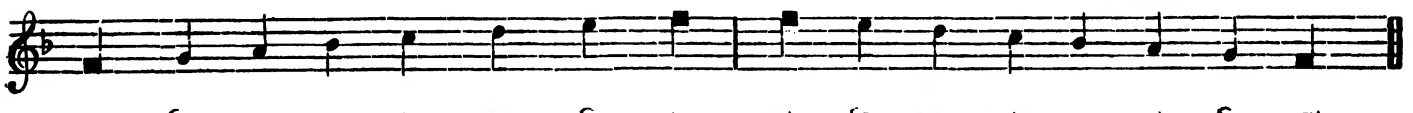
* প্রথম ভাগ ১৩৯ ও ২১৮ পৃষ্ঠা দেখ।

Natural Scale in the key of E. গ খরজের গ্রাম। গ खरजका ग्राम।



সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা
सा रि ग म प ध नि सा सा नि ध प म ग रि सा
Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

Natural Scale in the key of F. ম খরজের গ্রাম। म खरजका ग्राम।

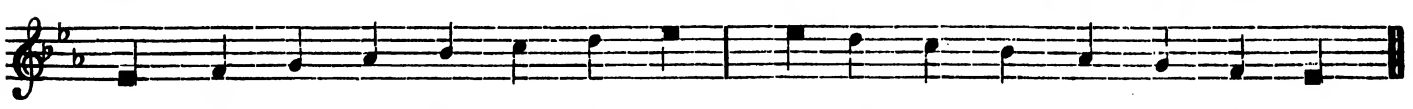


সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা
सा रि ग म प ध नि सा सा नि ध प म ग रि सा
Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

Natural Scale in the key of Bb. কোমল নি♭ খরজের গ্রাম। कोमल नि खरजका ग्राम।

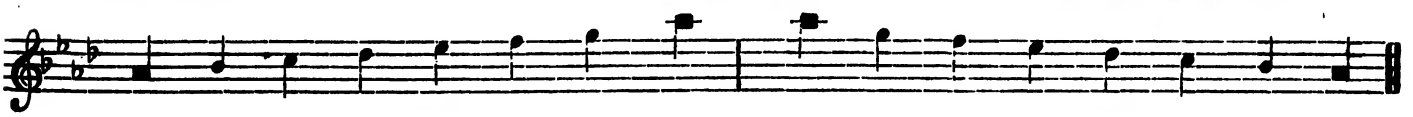
সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা
सा रि ग म प ध नि सा सा नि ध प म ग रि सा
Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

Natural Scale in the key of Eb. কোমল গ♭ খরজের গ্রাম। कोमल ग खरजका ग्राम।



সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা
सा रि ग म प ध नि सा सा नि ध प म ग रि सा
Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

Natural Scale in the key of Ab. কোমল ধ♭ খরজের গ্রাম। कोमल ध खरजका ग्राम।



সা রি গ ম প ধ নি সা সা নি ধ প ম গ রি সা
सा रि ग म प ध नि सा सा नि ध प म ग रि सा
Sā ri gā mā pā dhā ni sā sā ni dhā pā mā gā ri sā

In all the above scales the intervals are just natural intervals, which are the same as those in the natural, as distinguished from the tempered scales of Europe. These intervals in all the keys between the successive tones are :—

1st *i.e.* tonic	2nd.	3rd.	4th.	5th.	6th.	7th.	8th *i.e.* octave
sâ	*ri*	*gâ*	*mâ*	*pâ**	*dhâ*	*ni*	*sâ*
Major	Minor	Semitone	Major	Minor	Major	Semitone	.....Intervals
$\frac{9}{8}$	$\frac{10}{9}$	$\frac{16}{15}$	$\frac{9}{8}$	$\frac{10}{9}$	$\frac{9}{8}$	$\frac{16}{15}$	.....Represented by ratios
Do	Re	Mi	Fa	Sol	La	Si	Do [2]

Now, in the natural scales (both of Europe and India), in the different Keys, (as exemplified at pages 3—5) the *relative* pitches of tones (*i.e.* tonal relationship) are the same in all cases, but the *absolute* pitches are not the same. This will be manifest from the following diagram, which represents the standard scale of fixed notes, (or the key of C) and, below it, a new key which takes its governing note from D.†

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*This interval between *pâ* and *dhâ* (Sol and La) viz. a minor interval differs from the accepted theory of India, especially that of Bengal, where the interval between *pâ* and *dhâ* (5th and 6th) is supposed to be the same as that between *sâ* and *ri* (1st and 2nd) *i.e.* a major interval, and the interval between *dhâ* and *ni* (6th and 7th) is supposed to be the same as that between *ri* and *gâ* (2nd and 3rd) *i.e.* a minor interval. The above scales, used by the author for recording Indian Music, are identical with the European just natural scales. The retaining of natural intervals, even after change of keys, is also recognised in the European Sol-fa methods for teaching vocal music (see *Grammar* and *Standard Course* by John Curwen). The difference, about the intervals, between the 5th and 6th, and 6th and 7th, in the Indian, from the European theory, is probably due to the method of tuning of Indian stringed instruments such as the *Veena*, *Sitar*, *Esraj* &c., in which the same frets, (see page 2) which give the lower *ri* and *gâ* (*d* and *e*) in the second string, are also meant for lower *pâ* and *dhâ* (*g* and *a*) in the 1st string. The interval between *ri* and *gâ* is however a minor interval. Thus here, in the instrumental tuning, the interval between *pâ* and *dhâ* (5th and 6th) is the same as that between *ri* and *gâ* (2nd and 3rd) *i.e.* a minor interval. Again, the same pair of frets give middle *sâ* and *ri* (*c* and *d*) or the first string and lower *pâ* and *dhâ* for the 2nd string. Thus, here the interval between *pâ* and *dhâ* (5th and 6th) is the same as that between *sâ* and *ri* (1st and 2nd) viz. a major interval. Thus, in this method of tuning, the interval between *pâ* and *dhâ* (5th and 6th) is, in one place a major, and in another place a minor interval in the same instrument. Indian musicians and theorists are of opinion, that any such inaccuracy in tuning is corrected and the pure theoretical intervals between the tones brought, by putting more or less pressure on the strings in stopping them, and also by stretching the strings sideways while playing. Indian stringed instruments, with frets, being long, the length of strings no doubt allows these stretchings of them sideways. The frets are also of graduated heights, the tallest being near the nut, and the shortest near the bridge. Thus there remains sufficient space between the strings and most of the frets, to allow more or less pressure while stopping. According to the author of the Gita Sutra Sar, however, this difference of intervals between *pâ* and *dhâ* (*g* and *a*) and *dhâ* and *ni* (*a* and *b*), and such other niceties of distinction between the European and Indian systems, lies in theory and on paper only, in the Indian Musical works, but not in practical music, in which the intervals, according to the author, are identical in both the systems. The author, who had knowledge of both European and Indian Music, and was himself proficient in vocal and instrumental Indian music, has dealt with these matters in Vol. I of Gita Sutra Sar. About the identity of the intervals in Indian and European musical scales, Sir William Jones had also come to the same conclusion after practical experiments. He says:—"I tried in vain to discover any difference in practice between the Indian scale, and that of our own,.....I requested a German professor of music to accompany with his violin a Hindu lutantist, who sung by note some popular airs.....; he (the German professor) assured me that the scales were the same; and Mr. Shore afterwards informed me that, when the voice of a native (Indian) singer was in tune with his haprsichord, he found the *Hindu* series of seven notes to ascend like ours, by a sharp third." "On the Musical Modes of the Hindus" by Sir William Jones. Besides the natural scales some irregular scales do occur both in the Indian and European folk-songs. Of the former may be mentioned the folk-songs of such aboriginal tribes of India, as the Santhals, in which some tones may be found to depart from the natural scales. About the existence of irregular scales in European folk-songs, I refer to Clements's, "Introduction to the study of Indian Music" (Longmans Green & Co.,) page 13.

† Here Do, Re, Mi, Fa, Sol, La, Si, are taken as equivalent to the corresponding Indian names *sâ*, *ri*, *gâ*, *mâ*, *pâ*, *dhâ*, *ni*. Like *sâ*, *ri*, *gâ* &c., Do, Re, Mi &c. are assumed not to be fixed in pitch, but variable in their (*absolute*) pitches. C, D, E, F, G, A, B, are here assumed to be fixed in their pitches and to form the standard (just) natural scale *i.e.* the common natural scale.

sâ	*ri*	*gâ*	*mâ*	*pâ*	*dhâ*	*ni*	*sâ*
Do	Re	Mi	Fa	Sol	La	Si	Do^2...1st scale
C	D	E	F	G	A	B	C^2
	Do	Re	Mi	Fa	Sol	La .....2nd scale.	
	sâ	*ri*	*gâ*	*mâ*	*pâ*	*dhâ*	

It will be seen that in the 1st scale, the interval between Do and Re, which is the same as that between C and D, is a major interval. In the 2nd scale, the interval between Do and Re is also a major interval, so that if D be made the key-note (Do) the 2nd tone Re, of this key, cannot be exactly of the same pitch as E, as the interval between D and E is only a minor interval, while that between Do and Re (in the second scale) is a major interval. Thus the note E must be raised a little in pitch to make it the Re (*ri*) of the second scale. The E of the 1st scale (standard C scale) is, therefore not of the same *absolute* pitch as Re, the second tone, in the 2nd scale, in the key of D. The *relative* pitches of all the tones, however, taken from the key-note, are the same in both the keys. Thus in both the above scales, the intervals between Do and Re (*sâ* and *ri*) are major intervals. The change of *absolute* pitch of tones is inconvenient for change of keys in European keyed instruments, such as the pianoforte, organ, harmonium &c. To obviate this difficulty the natural scale is slightly altered by equal temperament* so that any key of these instruments may be made the tonic, and the other tones sounded from the corresponding keys, (of these instruments).

In this system each note on the staff is made to represent a key of the pianoforte &c., instruments, and is *absolutely* fixed in pitch. The staff-notation is thus generally accepted as depicting tempered scales in Europe. This use of the staff-notation, as a tempered notation, though convenient for European instrumental music, is not suitable for Indian Music including those, mostly vocal, that were compiled and recorded in notation by the author in his Gita Sutra Sar. It is not also suitable for Indian musical instruments. Thus, for the 2nd scale of the above example, (in the key of D) the transition from the key of C is done in the Indian stringed instruments, by re-tuning the second open string, (which was tuned to C) to the new tonic D (see p. 2). This D is now the new *sâ* (Do, or key-note). The 1st string is then tuned to its upper fourth,† and the frets unaltered give the corresponding 2nd, 3rd, 4th, 5th, &c., tones (*i.e. ri, gâ, mâ, pâ* &c.,) of this new key. The positions of the frets remaining unaltered, the tonal relationship of the tones in this new scale (in the key of D) remains the same as in the former scale in the key of C, *i.e.* just nutural intervals. Thus the tempered scales, and notation therefor, are not suitable for Indian Music, both vocal and instrumental.

The tempered scale, though accepted as a necessary evil for European instrumental music, is replaced by the natural scales, for purposes of vocal music, and of free-toned instruments such as the violin &c., even amongst Europeans, especially those who advocate the teaching of vocal music by the Sol-fa system.‡

* The theory of natural scales and of equal temperament have been dealt with later on.

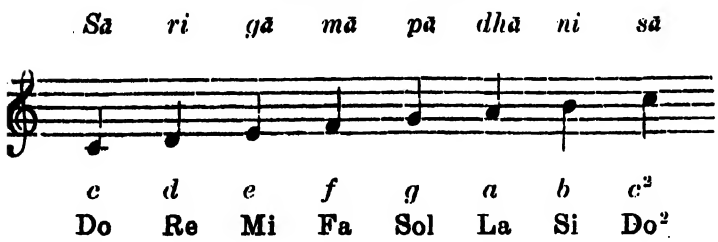
† or to the upper fifth, as done in some cases, and with some instruments.

‡ "This scale, in its exact proportions, is also the most natural and easy for the human voice—that most wonderful of all musical instruments—in any key. The violin too can give accurate *intonation*. But the ordinary piano, organ, and other keyed instruments do not produce this scale of nature and of the voice in exact tune. It may be easily seen that if they were made perfectly correct in one key, some of the notes must of necessity be incorrect, by a degree or two, in all the other keys. They are therefore called "imperfect" instruments, and, in tuning, they require to be "tempered", or to have their defects so distributed that they shall be as little noticed as possible. Mr. Graham, in his "'Theory and Practice of Musical Composition'", shows the great injustice, and the great injury to music, which arises from the frequent endeavour to form the voice—a perfect instrument—according to the false intonation of such instruments as these. Gen. Thompson says:—"'It may be hoped the time is approaching when neither singer nor violinist will be tolerant of a tempered instrument. Singers sing to the pianoforte because they have bad ears; and they have bad ears because they sing to the pianoforte.'" *"Grammar"* by John Curwen, Sec. VII.

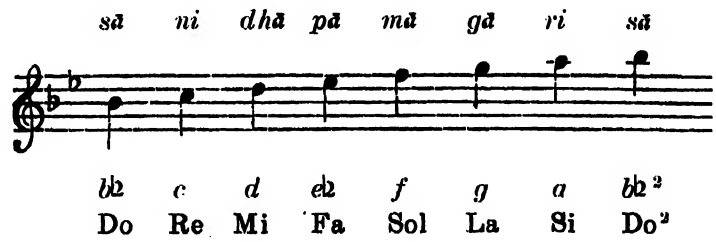
The tempered scale is all the more unsuitable for Indian music, which, as already said is generally of the monodic type, in which defects of intonation are not masked, as is possible in the case of European music, by harmonised parts. I have already shown that the method of tuning of Indian stringed instruments, with frets, does not admit the tempered scale. The better type of vocal Indian Music is accompanied by the *Saringi* or the *Tambura*. The former is the Indian fiddle, a free-toned instrument, which faithfully reproduces the natural intonation of the human voice. The *tambura** is an open-stringed instrument, with a long neck, without either frets or finger-board. It has four strings, which are tuned generally to lower *pâ* (Sol), middle *sâ* (Do), the next string, again to middle *sâ*, and the next to lower *sâ* (Do) of the singer's voice.† The singer, when accompanying his song by this instrument, himself holds its neck near his ear and continues striking successively the open strings, which give the pure tones Sol, Do, Do, lower Do, in succession. The strings being long, the instrument is rich in harmonics.‡ These tones, with their harmonics, resound continually near the singer's ears most of the tones of the natural scale, so that with such an accompaniment, it would be impossible for any singer, with a sensitive ear to attune with these natural§ tones of the *tambura*, the tones of a scale sung by him, in anything but just tuning.†† To suit the Indian purpose, specially that of vocal music, the author has used the staff-notation as representing natural scales.

In the use of accidentals also, where a note (whose *absolute* pitch is already fixed) is raised by a sharp, or lowered by a flat sign, this raising or lowering, is meant to be a just semitone, by the author. Thus, where the *absolute* pitches of B and F are already fixed, B♭ means a just semitone below B, and F♯ means a just semitone above F. This change, by accidentals, of an *absolutely* fixed pitch is necessitated in Indian Music, in cases of change of keys and also for the purpose of ornamental embellishments. Thus, in the following scales the key-note (the tonic *i.e. sâ* or Do) in the scale in key of B♭, is a just semitone below *b* of the standard scale:—

Standard Scale.



Scale in key of B♭.



Here, the key-note *b♭*, in the key of B♭, is taken by lowering the *b* of the strandard scale, by a just semitone. Where, however, a flat-note, (as *e♭* in the above scale of B♭), or a sharp note, is not the tonic, but represents the 2nd., 3rd., 4th., 5th., 6th., or 7th., tone of a scale, it does not necessarily mean that the flat or sharp note is a just semitone below or above the corresponding note of the standard scale. In these cases the sharp or flat note takes its *relative* value in pitch, from the key-note of the scale. Thus in the above

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* The *tambura* called *tânpurâ* in Bengal, is further detailed later on. The method of tuning given above, is what is generally done in India, specially in Bengal.

† See page 3 foot note.

‡ For explanation of 'harmonics', the reader is referred the science of acoustics, dealt with in books on Theory of Sound.

§ The common natural scale, as detailed hereafter, can be sounded, and formed by the sub-division of a string, of a stringed instrument, into its aliquot parts of 2, 3, and 5. This scale does not recognise the septimal tone and interval. This tone can be produced by the sub-division of the string into the seventh and its aliquot parts. Mr. Deval, and following him Mr. Clements, have discovered, besides the standard natural scale, this septimal interval in some specimens of Indian Music. See "Introduction to the study of Indian Music" by E. Clements, (Longmans, Green & Co.,) pp. 7, 31-33. Mr. Clements also speaks of the existence of this septimal interval in European Folk Songs (ibid p. 13.) Both Messrs. Deval and Clements term these septimal intervals as forming parts of irregular scales. They may be termed "irregular", but they are not unnatural. These septimal intervels, and tones may be evolved as harmonics by the natural sub-division, while played, of the string into its seventh, and its aliquot parts. Thus, if these septimal intervals do actually occur, in practice, in any Indian Music, these intervals will attune to the harmonics produced by the strings of the Indian *tambura*.

†† Thus "the best singers in India, those whose art has not been contaminated by the tempered harmonium, prefer to sing to an accompaniment of the tambura alone, or the tambura with drums." Introduction to the Study of Indian Music, by Clements page 8.

case, in the key of B♭, the note *d♭* is Fa, *i.e.* a major fourth above *b♭* (Do).* Now, *d♭*, taken on the standard scale *i.e.* the tone a semitone below '*c*' of the standard scale, is not exactly a just major fourth above *b♭*, similiarly taken on the standard scale (*i.e.* a semitone below *b*). This will be apparent to one acquainted with the values of just natural intervals. To those that are not familiar with these values, I refer to the chapter on 'natural and tempered scales', dealt with hereafter. The above values of *b♭*, *d♭* and *f♯* are given by way of illustration, in order that they may be easily understood. Strictly speaking *b♭* is not a just semitone below *b* but a just semitone above *a*, while *a♯* is a just semitone below *b*. These values of sharps and flats of tones have been adopted in the Tonic Sol-fa system of England.† The author has also discovered the above relations for sharps and flats of tones for the theory of his scales, and of his musics. Says the author, in Gita Sutra Sar, Vol. I, ch. 4 :—

Values of sharps and flats uncertain in India.

"In Indian Music no scientific rule has yet been framed as to how much raising or lowering will sharpen or flatten a tone. *Ustâds* (Indian virtuosos) sing these *Vikrits* (accidentals) by raising or lowering the tones according to their own practice, taste, and training. In ancient Sanskrit works also nothing can be found about this, clearly..... The interval between *gâ* and *mâ* (Mi and Fa), and between *ni* and *sâ* (Si and Do²)—is the standard for sharpening or flattening a tone. This rule seems to be very reasonable, as...in (Indian) instrumental music this method is prevalent..... The frets (see page 2) which give lower *dhâ* and *ni* flat (*a* and *b♭*) in the First string, also produce lower *gâ* and *mâ* (*e* and *f*) in the Second string; and next to these, the frets for *ni* and *sâ* (*b* and *c*) in the 1st string, produce lower *mâ* sharp and *pâ* (*f♯* and *g*) in the 2nd string.....Assuming *sâ* (*c*) to be *gâ* (*e*) and raising this to *ma* (*f*) it will come to *ri-Komal* (*ri*-flat *i.e. d♭*).....Assuming *pâ* (*g*) as *sâ* (*c*) and lowering it as *ni* (*b*) we shall get *Kari-mâ* (sharp *mâ i.e. f♯*)."

Values of sharps and flats accepted by author.

Similiar values, for sharpening and flattening other tones, have been accepted by the author. These would be followed hereafter, and in understanding the theory of the author's musics, the same values should be given to the sharps and flats.

These relative pitches of sharp and flat forms of notes, are to be understood to relate to those cases only (as already said at page 8) where the (pure forms of the) notes are already absolutely fixed in pitch *e.g.* in the standard scale. A sharp or flat key-note has this relative value. Thus, in this strict sense of the relative pitches for sharp and flat forms of notes as given by the author, the value of the key-note *b♭*, in the key of B♭, is a just semitone above *a* (and not a just semitone below *b*, as spoken of at page 8. For the difference between these two values, see chapter on Natural and Tempered scales). Where a note, however is not a key-note, but lies within, and forms part of a scale, the value of the sharp and flat may (similiarly to what has been spoken of at page 8) vary in pitch. An example of this has already been mentioned. I give below a simpler example showing this change in *absolute* pitch, of notes, with accidentals, in different keys.

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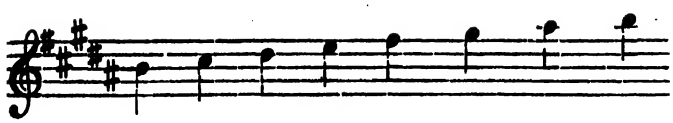
* Similiar to what has been done before (see page 6, foot-note), Do, Re, Mi, Fa, &c., are assumed to be variable in their absolute pitches, and are taken as equivalent to the Indian *sâ, ri, gâ, mâ*, &c.; *c, d, e, f, g, a, b*, are taken here as fixed in their absolute pitches, and forming the standard (just) natural scale. The pitch of the middle *c* of this standard scale, is to be taken as equivalent to that of some European standard. The meaning of Do, Re, Mi, Fa &c. as adopted here, will be followed hereafter. As regards *c, d, e, f, g, a, b*, they are to be understood to represent the above *absolutely* fixed pitches when spoken of in connection with the standard scale. On the other hand when *c, d, e, f*, &c. are used in connection with singers, the middle *c* should be taken to mean the middle *sâ* of the singer's voice. This middle *sâ* varies amongst different musicians. It is taken by guess, as found convenient by each musician (see page 3 foot note), when playing or singing. The middle *sâ*, of an individual musician also, thus varies in *absolute* pitch, when singing or playing on different occasions. When, however, the pitch of the middle *sâ* is once determined by a musician, for the purpose of a performance, this *sâ* is assumed to be fixed in pitch, for him, and this *sâ* is what is meant by the 'middle *sâ* of the singer's voice'. All other tones are then related to this *sâ*, and for an individual Indian Musician, Key *c* is to be understood to be based on this *sâ* (*c*). For him the *c* of all *Thâts* (modes) is this *sâ*.

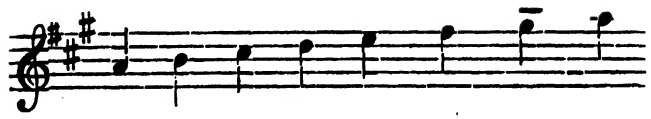
† See chapter—*Time and Tune—Sixth step* of *Standard Course* by John Curwen, Re-written by other authors, 5th Edition, 1901, J. Curwen & Sons Limited, London.

Scale in key of B.



Sâ ri gâ mâ pâ dhâ ni sâ
Do Re Mi Fa Sol La Si Do^2

Scale in key of A.



Sâ ri gâ mâ pâ dhâ ni sâ
Do Re Mi Fa Sol La Si Do^2

In the above scales, $c\sharp$ as Re (*ri*) in key of B is a major interval above *b* (which is Do here). Again $c\sharp$ is Mi (*gâ*) in the key of A, is a minor interval above *b* (which is Re here). Now the major and minor intervals are represented by the ratios $\frac{9}{8}$ and $\frac{10}{9}$, respectively. Thus $c\sharp$ is $\frac{9}{8}\,b$ in one case, and $\frac{10}{9}\,b$ in another case. This change of value in *absolute* pitch of notes with sharps and flats, and of notes without any accidentals* do not lead to any confusion in Indian Music, as in this music, both vocal and instrumental, there is very little change of scales in a piece of music, or in a single class of musics, called *Râga.*† For singing or playing allied *Râgas*, change of scales** are also not required. Transpositions, however, may occur in a single piece of music, when that music includes two or more separate and distinct *Râgas.* In such cases practically different pieces of musics are grouped together.‡ Thus, generally speaking, transpositions are not required for a single piece of music.§ A single song or music does not, again, contain more than seven tones‖ in its *Thât* (mode). Thus, the just natural intervals between the tones, can be easily maintained while singing or playing.

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*An example of change of absolute pitch, of notes without accidentals, in different keys, has already been given. (See page 7) Another example may be had from the scales in the keys of B♭, and the standard scale, (See page 8). There *d* as Mi (*gâ*) in the scale of B♭, is a minor interval above *c* (which is Re *i.e. ri* here), while *d* is a major interval above *c* in the standard scale. Thus *d* has two values in absolute pitch in these two scales.

†*Râgas*, (by which word the author includes *Râginis*), are melody-types. These are detailed later on. Though unrecognised by Indian Musicians, actual change of keys may be found to exist within a *Râga*. This has been dealt with later on.

**More strictly speaking change of *Thâts*. For meaning of *Thât* see *post.* and also page 2. *Râgas*, not allied to each other may have the same *Thât*. When these *Râgas* are played successively, change of *Thât* is also not required.

‡A music may also be formed by the blending of different *Ragâs*. In such cases transitions may occur within the music. These transitions (*Kharaja* or *Shadja Sankraman*) are generally in allied keys, for which the frets, of instruments with moveable frets, are not required to be shifted. Where, however, in the process of change of keys one or more tones, in a particular section of the music, cannot be sounded by stopping on the frets, (as arranged for the *Thât*), this difficulty, (in sounding the particlar tones), is overcome, by either stopping on the open string, or by stretching the string on a fret (see page 6 foot note).

§Transpositions of scales are understood by indigenous Indian Musicians, to mean transposition from one *Thât* (mode. including scales) to another. As already mentioned, unknown and unrecognised by Indian Musicians, there may be actual transition *i.e.* change of keys within a music, though these musicians do not understood it, and think that they sing or play that music in a single *Thât* only. (For more detailed description of these transitons see *post.*). As in these change of keys, the tones of the different keys do not generally travel beyond the prevalent *Thât* of the music (*i.e.* beyond the tones, which these Indian Musicians understand as constituting the *Thât*), the above remarks about intervals hold in these cases also. Transposition, in the Indian sense, may however occur where a single piece of music includes two or more separate and distinct *Ragâs* (placed successively and not blended together, as spoken above). In such cases practically different pieces of musics are grouped together. These cases are rare in practice.

‖More tones may occur as ornamental embellishments, which, in Indian Music, alike with the European system, are not termed as distinct tones of a scale. Sometimes it so happens that in a music, both *mâ* and *mâ* sharp (*f* and $f\sharp$) or *gâ* and *gâ* flat (*e* and e♭) and *ni* and *ni* flat (*b* and b♭) are used. These are said to form parts of its *Thât.* In such cases, either the natural, and sharp, or flat forms of the tones, are used alternately in ascensions and descensions, (as is also the case with some scales of European Music), or there is actual transition (*i.e.* change of keys) within the music, though not understood as such, by Indian Musicians. The scales of these musics, similiar to the European system, are said to contain seven tones only, and not eight or nine. Transitions have been detailed later on. The *Thât* (mode) of a music may, however, contain less than seven tones *e.g.* six tones (hexatonic) or five tones (pentatonic). These are dealt with later on.

That (Mode). Transposition (change of That).

That (ठाट)

Thât, as understood for instrumental purposes, has already been explained (see p. 2). *Thât* is also used in the sense of mode* (which includes also scales) of a music, or of a class of musics. Each *Râga* (melody-type) has a *Thât* of its own, but, as already explained, more than one *Râga* may be in one *Thât*. Thus, when musics in one *Râga* or in several *Râgas*, having the same *Thât*, are played† successively, no transpositions are required, as the instrument is ready tuned, for playing or accompanying that particular *Thât*. Transpositions are necessitated when a music, or class or classes of musics, having one *Thât*, is followed by another having a different *Thât*. In that case, the frets (of instruments with moveable frets) are shifted, when required** as spoken of before (see p. 2) to make the instrument fit for playing the new *Thât*. This is one form of transposition. Another sort of transposition is required for accompanying singers,‡ having different compasses, *i.e.* different ranges in the pitches of their voices. To accompany a new singer having voice of a different compass from that of the one for whom the instrument was ready tuned, the strings are freshly tuned as spoken of at pp. 2—3. For this purpose, the strings§ meant for the tonic, is tuned to the middle *sâ* (Do) of the new singer's voice, and the other (chanterelle) strings, to the corresponding *mâ* (Fa) or (as is done in some cases and also in some instruments), to *pâ* (Sol). The rest of the strings are then tuned to suit this new *sâ* (Do). The frets then give the corresponding *ri* (Re), *gâ* (Mi), *mâ* (Fa) &c. Thus without any device of temperament,‖ the pitch of the tonic is changed, and at the same time, the tonal relationship, of just natural intervals of tones, maintained. The above is the Indian method for accompanying singers having different compasses of voices. Similar is the method for transposition of key-notes. For this purpose, the string or strings meant for the tonic (*sâ* or Do) is tuned to the new key-note, and the other strings in conformity therewith. Thus, amongst Indian Musicians, transposition from *sâ*-kharaj (key *c*) to *mâ*-kharaj (key *f*) means that the tune of the open string, (or strings) intended for sounding the tonic, is changed from *sâ* (*c*) to *mâ* (*f*), and the other strings, tuned to suit this new key-note.¶ Thus *mâ* (*f*) becomes the new Do (*sâ*), and the (unaltered) frets give the corresponding Mi, Fa, Sol, La, Si &c. The tonal relationship between these new tones thus remains unaltered *viz.* just natural intervals, in the new key.

Transposition. Kharaj or Shadj Paribartan.

खरज परिवर्त्तन

*Mode is here used in a general sense, and not merely in the sense of the Authentic and Plagal modes of Europe. "A *Thât* comes nearest to what with us is implied by a mode, and cosists in determining the exact relative distances of the several sounds which constitute an octave, with respect to each other." Capt. Willard's *Treatise on the Music of Hindoostan*—Chapter—of *Râgas* and *Râginis*.

†or sung, and accompanied in an instrument.

**This is especially required, as spoken of at page 2, when the change is from the common scale (*Thât*) to a *Thât* having sharp or flat tones.

‡Indian singers, (as already said, see page 1), generally sing solo.

§or strings.

‖This method of tuning of Indian stringed instruments has no doubt the advantage of dispensing with the artificial tempered scales. It has however, defects of its own. For each new singer, not only the stringed instruments, but also the instruments for drumming such as the *Tablâ* or *Mridanga*, have to be freshly tuned, a process which proves very tiresome and tedious to the audience. This trouble may, to a certain extent, be obviated by having instruments tuned beforehand. But this will require a fresh set of instrument for each new singer. Again, to suit new voices, or to suit new keys, the strings may be required to be stretched too loose or too tight, to affect the sweetness of the sounds of the instrument. Thus, the full rich sounds of the instrument can not always be maintained. *e.g.*—to suit voices of low pitch, and for lower key-notes, the strings may have to be stretched too loose, resulting in flat and unmusical sounds. Similiarly voices, or keys of high pitch, may either be beyond the capacity of the instrument, or may necessitate stretching of the strings too tight, giving harsh and unpleasant sounds. This, however, must be accepted as a necessary evil, in the present system of Indian instruments. To obviate this difficulty Indian Musicians, are compelled to tune the strings in practically the same pitch for all classes of songs, and thus not getting much range of pitch, they have to sing every variety of songs in the same key. The proper artistic effect of some songs are thereby not produced. Says the author (Gita Sutra Sar Vol. I. Ch. 17.)—"On this account, it has so come to pass that those practised in singing *Kheyal* and *Dhrupad* songs cannot sing with proper artistic effect *Thunri* and *Tappâ* songs and *vice versa*."

¶The author, as already spoken of at page 3, has written some of his musics to suit this Indian method, by writing the music in key c, and by showing at the heading the value of the key-note as *ri kharaj*, *gâ kharaj* &c. The meaning of this, for purposes of vocal music, has already been explained at page 3. In the existing system, transitions to key F, and key G are possible in Indian stringed instruments without recourse to re-tuning. For playing, or accompanying in other keys the above headings mean, that the string (or strings) meant for the tonic (*sâ* or Do) should be tuned to *ri* (*d*), *gâ* (*e*), &c. of the standard scale,

NATURAL SCALES.

An Indian Musician, accustomed to the above method of tuning of stringed instruments, will easily understand that any temperament or tempered scales are not absolutely necessary for change of keys. Thus, it is not difficult for an Indian Musician to comprehend, that the relative pitches of the notes of the standard (natural) scale of the author (shown at p. 2) are the same as those of the other scales in other keys (exemplified at pp. 3—5) *i.e.* the intervals between tones, in all the scales in all the keys, are just natural intervals. To Europeans, who are accustomed to equal temperament (as that of the pianoforte) and to understand and read the staff-notation in this sense of a tempered notation, (in which each note on the staff is taken to be *absolutely* fixed in pitch), the above Indian method of transition without recourse to temperament, may seem confusing. To any musician, however, whether Indian or European, whose ears have been trained to natural intervals, and thereby this natural delicate sense of perception of his ears has been retained, and not spoilt by tempered instruments,* the above method of the author of using the staff-notation as depicting just natural intervals, would not be be a difficult thing to understand. Such a musician, trained as he has been to sing or play in natural scales, would easily understand the author's musics, and it would not be a difficult task for him to perform them in free-toned insruments, such as the Indian *sâringi*, and the European violin, violoncello &c. I may mention here that this use of the staff notation, as depicting natural scales (including flexible *absolute* pitches, and fixed *relative* pitches of notes), is not unknown even in Europe, at least for purposes of vocal music, *e g.* the explanations of the staff-notation, given in *Grammar* and *Standard Course* by John Curwen. The author of the Gita Sutra Sar has used the staff-notation, including its signatures, and names of notes, for the purposes of Indian Music, in this sense of natural scales and of just natural intervals between the tones of the notes.† **A note, thus, though retaining its name, sign, position, and accidental on the staff, may differ in absolute pitch in different keys, while the relative pitches of the notes (taken from the key-note) remain fixed and unaltered by change of keys. This sense of flexible absolute pitches, and fixed relative pitches (tones) of notes, should always be borne in mind in understanding the (modes including) scales of the author's musics, and in singing and playing them.** Should any attempt be made to add parts to or to harmonise any of the author's musics, those just natural intervals** should always be kept in view, as otherwise, these musics would be liable to loose their especial characteristics, and any attempt at temperament, as already said, (see page 1), may even spoil the melody.

Natural intervals should be kept in view in attempts to harmonise author's musics.

and the rest of the strings in accordance therewith. The pitches of the key-notes in these cases, will thus be *d*, *d̲*, &c. taken from the standard scale. For pitching a flat tone in the voice, the author advises that the tone below the natural tone which has been flattened should be imagined as *ni* (Si) or *gâ* (Mi) and thence ascent should be made to *sâ* (Do) or *mâ* (Fa) respectively. Thus to pitch *d̲*, one should run up from *d* thus—D—*ni*—*sâ*=*d̲* (*gâ̲*). Taking D as *ni* (Si) the pitch of *sâ* (Do), will give the correct value of *d̲*. Similiarly by ascending as D—*gâ*—*mâ*—*gâ̲* (*d̲*), we get from *mâ* the pitch of *d̲* here. In this connection, I think the following hints, for pitching key-notes by sol-faing as given by John Curwen, which are similiar to those of the author, will be found useful:—"The pitch of the key-note is given at the heading or signature of a tune.....(as).....'Key A' 'Key G', &c." (It means that the pitch of DOH, or the key-note of the tune is the same as the A, G, &c. of the standard scale. The standard natural scale is advised to be learnt *viva voce*, by students of music, from a teacher. This, being the natural scale of the human voice, will be more easily learnt, and committed to memory, than any artificial, tempered scale such as that of the pianoforte, organ &c.). "In pitching a tune it is customary to take the upper C' of the standard scale, from a TUNING FORK, to descend to the pitch-note required, and then give its sound to the syllable DOH. DOH thus fixed, establishes the relative position of all the other notes of a tune.....Suppose.....the pitch of DOH in the tune (to be sung), is the same as D in the standard scale.....(To pitch it)... .run down from C' swell out to D, and then sound DOH the same as the D.....(Thus)..... | C':— | B : A | G : F | E :— | D :— | DOH :—". *Grammar* by John Curwen, Sec IV. See also *Standard Course* by John Curwen, 5th ed. 1901, page 33.

*such as the harmonium, pianoforte, organ &c.

†For meanings of tones and notes, see page 3.

**According to the belief of modern Indian musicians, there are other especial and elaborate rules of construction for each Indian *Râga*, which, they say, must be strictly observed, to retain the individually of the *Râga*. They will say that these rules must also be observed for purpose of harmonisation, as otherwise, according to their theory, the *Ragâs* will be altered in their character and loose their identity. These rules of construction for *Râgas* (melody-types) of modern Indian music, however remain yet to be discovered, properly shaped classified, and written, with illustrations of practical examples of written musics,

In depicting these natural intervals, the author of the Gita Sutra Sar, has not, however, over-burdened the staff-notation to a fault. Thus, strictly speaking, according to theory, there is a difference between *c* sharp and *d* flat. As these niceties of distinction are not appreciable in practical music, if these tones are played side by side, the author has not kept up this distinction, when used within a mode (including scale). In such cases, without meaning any distinction in pitch, the author has used one, or the other, as found convenient for writing or printing. Where, however, a sharp or flat note represents a key-tone, its pitch is fixed in each case, the value of which is to be taken to be the same as that described at page 9.

Sampurna, Auraba, Kharaba (Shadava).

I have already said (see page 10 foot note) that a music may have a *Thât* (mode, including scale) of less than seven tones. The classes of music in which the seven tones are used in their *Thâts*, are called *Sampurna* (सम्पूर्ण *i.e.* full). Those that use six tones are called *Khâraba* (खाडव) or *Shâdava* (षाडव) *i.e.* hexatonic, and those in which five tones are used are called *Auraba* (औडव) *i.e.* pentatonic. These hexatonic and pentatonic scales (strictly speaking *Thâts*) may be regarded as abridgments of the complete scales (or *Thâts i.e.* modes) to which they approximate. Thus, in the musics of the author, which are either hexatonic, or pentatonic, the just natural intervals are maintained *i.e.* the intervals between the tones in these cases are just major, just minor, and just semitone intervals, and combinations of just major, just minor, and just semitone intervals. Examples of hexatonic and pentatonic musics may be found in this book *e.g.* song *Nâda Bidyâ* in *Râga Deshakâra* is hexatonic. It omits *mâ* (*f*). Its *Thât* is *c*, *d*, *e*, *g*, *a*, *b*. So also song *Anagana Phuli*, in *Râga Panchama*, is hexatonic. It omits *pâ* (*g*) and in it *ri* (*d*) is flat. Its *Thât* is *c*, *d♭*, *e*, *f*, *a*, *b*. The following may be mentioned as examples of pentatonic musics. Song *Anta na pâwata* in *Râga Brindâbani-Sârang*. It omits *gâ* (*e*) and *dhâ* (*a*), and its *Thât* is *c*, *d*, *f*, *g*, *b*. Song *Mâlati Ketaki* in *Râga Hindol* omits *ri* (*d*) and *pâ* (*g*) and in it *mâ* (*f*) is sharp. Its *Thât* is thus *c*, *e*, *f♯*, *a*, *b*. These omitted tones are believed by orthodox Indian Musicians to be *Bibâdi** (विवादी) or inimical to the *Râgas i.e.* the introduction of these omitted tones, would, in their opinion, destroy the special characteristics of the melody of the *Râgas*. These omitted tones, nevertheless, though forming no part of the modes (or scales), may, and have actually been, occasionally judicially introduced by the author, as ornamental embellishments, without injuring the individuality of the *Râga*; *e.g.* the use of *g* (*pâ*) in the last but five bars in the above-mentioned song, *Anagana Phuli*.

Bibadi (विवादी)

Other Thats (Modes),

Besides the *Thâts* (modes, including scales) already exemplified, which are similar to the European major scales, and the hexatonic, and pentatonic scales, there are other *Thâts* (modes) in Indian Music, in which the two semitones do not lie between the 3rd and 4th, and the 7th and 8th tones of the octave, as is the case with the major scales. Some of these *Thâts* (modes) are similar to the European minor scales. These Indian *Thâts* do not, however, retain in all cases the same relative positions of the semitones, as are the cases with European minor scales. Amongst several examples in this book of musics in these *Thâts*, the following may be mentioned:—Song *Kauna tuma hâhâ* in *Râga Sindurâ*. Its *Thât* is *c*, *d*, *e♭*, *f*, *g*, *a*, *b♭*. Song *Sârâdâ Vidyâ* in *Râga Bhairabi*. Its *Thât* is *c*, *d♭*, *e♭*, *f*, *g*, *a♭*, *b♭*. The *Thâts*, of the *Râginis* given below, with illustrations of *Moorchhanâs*, are also examples of these *Thâts*, (which are not major scales). By transposition, many musics of these *Thâts* may, no doubt, be written in major scales. The author has in some instances, done this, as shown below.

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and not merely by reference, to a large extent at least, (as done in ancient theoretical works) to the musics produced in the voices of expert Indian musicians, in which vocal (and not written) form only, Indian Musicians say the *Râgas* in their true shapes can be found to exist. It may be mentioned here, that the indigenous method, of teaching music in India, is *viva voce*, from ear to ear, without the help of any proper notation, or written music. The author was one of the few pioneers, who compiled and recorded Indian music, especially the higher class of this music, in notation.

*A tone, though not omitted from a *Thât*, but forming part of it, may also be *Bibâdi* to some other tone. Thus—in theoretical ancient sanskrit works, two tones that are two *srutis* (*i.e.*) a semitone apart, are called *Bibâdi*. The author, differing from the view of modern commentators, thinks that *Bibâdi* here means discordant, or dissonant.

Moorchhana (मूर्च्छना)—This word has been misunderstood for Mir* and other ornamental embellishments by some modern Indian writers, and also by some European scholars. *Moorchhanâ*, in the (sanskrit) sense, as used by the author, is similar to the ancient Greek modes. Thus *ga moorchhanâ* means mode of *gâ, mâ, pâ, dhâ, ni, sâ, ri*, or *e, f, g, a, b, c, d*, which is the same as the Phrygian mode. The prevalent *Thât* of *Râginis Bhairabi, Gândhari*, and *Tori* may be transposed to this mode. Thus:—The *Thât* in vogue of these *Râginis* are *sâ, ri♭, gâ♭, mâ, pâ, dhâ♭, ni♭*, or *c, d♭, e♭, f, g, a♭, b♭*, and if we make *e* the first note, we get this *Thât* transposed to the mode *e, f, g, a, b, c, d*, (as will be seen from the fact that the positions of the semitones are the same in both the cases). In this connection it may be noted that this prevalent *Thât* of *c, d♭, e♭, f, g, a♭, b♭*, may also be transposed to the (natural) scale in the key of A♭ (major), thus:—if in the above *Thât*, we begin from *a♭* as the first note, we get the *Thât a♭, b♭, c, d♭, e♭, f, g*, which is the scale of A♭ (major). The author has shown some musics in the form of the *Thât* that is in vogue *i.e. c, d♭, e♭, f, g, a♭, b♭*, as for example song *Tu kniyo rodiâ* in *Râga* (more strictly speaking *Râgini*) *Bhairabi*. He has also shown this song transposed to *ga moorchhanâ*. Other examples of similar transpositions to *ga moorchhanâ* are—song *Nâda nagara basâye* in *Râga Gurjjari Tori*, song *Ko-eliâ mada mâti* in *Râga Gândhâri Tori*. This song has also been shown in the prevalent *Thât*. Besides the above *ga moorchhanâ*, identified with the Phrygian mode, the author has identified several other *Moorchhanâs* of ancient sanskrit theoretical works,† with other ancient Greek modes. The author has, by transposition, also identified some modern *Thâts*, with these ancient sanskrit *Moorchhanâs* and European modes. Some examples of these are given below:—

Name of Râgini.	Its *Thât* in vogue, and transposition therefrom.	*Moorchhanâ* to which transposed.	Name of equivalent Ancient European Mode
Sindhu ...	Do—Re + Mi♭—Fa—Sol—La + Si♭—Dó Re—Mi + Fa — Sol—La—Si + Do—Ró	... *ri moorchhanâ*‡ ...	Authentic Dorian
Iman ...	Do—Re—Mi—Fa♯ + Sol—La—Si + Dó Fa—Sol—La—Si + Do—Re—Mi + Fá	... *ma moorchhanâ* ...	Authentic Lydian
Jhinjhoti ...	Do—Re—Mi + Fa—Sol—La + Si♭—Dó Sol—La—Si + Do—Re—Mi + Fa— Sol′	... *pa moorchhanâ* ...	Mixo-Lydian
Kânâra ...	Do—Re + Mi♭—Fa— Sol + La♭—Si♭—Dó La—Si + Do— Re — Mi + Fa — Sol —Lá	... *dha moor-chhanâ*	Æolian

Other *moorchhanâs* will be exemplified hereafter. Some examples, of transpositions by the author of his musics to a *moorchhanâ*, have already been given. Another such case is song *Anandi Jagabandi* in *Râga Iman Kalyan*, which has been trasposed to *ma moorchhanâ*.

THATS compared with Major and Minor Scales.

THATS should not be identified in all respects with European Major and Minor scales.

The *Thât* of *Râgini Kânârâ*, as shown above, is the same in descension, as the scale of C minor. But these two do not agree in ascension, as the *Thât* of *Kânârâ* is the same, both in ascension and descension. Thus, though other *Thâts* may appear similiar to some European minor or major scale, too much analogy should not be drawn therefrom, between the properties of these Indian *Thâts*, with all the incidents, (including the mental effects), of the

*Mir (मिड़) is the closest kind of legato, formed by the gliding from one sound to another through their intermediate grandations. *cf.* Portamento.

†These are detailed in Vol. I of Gita Sutra Sar. Both Vols. I and II were written and published by the author, in Bengali. Vol. I has not yet been translated. The theory of the author's transpositions as dealt with by him in Vol. I, will be detailed later on.

‡*Cf.* Re Mode, Mi mode &c. of *Standard Course* by John Curwen. The positions of the semitones are shown by the sign +. Similar to that at page 9, the Sol-Fa names *sâ, ri, gâ, mâ* &c., used by the author, have been translated here as Do, Re, Mi, Fa &c., as the pitches of the tones are not absolutely fixed but variable in different Modes. *e.g.*, La, as fifth of Re, in the 1st. of the above modes is a little higher than La (*a*) of the (common) standard scale. (For the value of this higher La see *post.*, in connection with the division of the scale into 53 degrees.)

European major and minor scales. There is, however, this thing common between the *Thâts* (modes including scales) of Indian Music generally, and the European diatonic (Major and Minor) scales, that there are only two semitones, within the octave, and they are not placed side by side.* Other incidents of Indian *Thâts* and European diatonic scales do not always agree.† I have already shown that the intervals, in all the author's scales exemplified at pp. 3—5, and also in the hexatonic and pentatonic scales, (see p. 13), are just natural intervals. Such is also generally the case with the other *Thâts*. Thus, it will be seen, that the intervals between the tones of an octave in generally all the *Thâts* (modes, including scales) of all the author's musics, are just natural intervals.‡ In the practical examples of *(Râga)* musics the *Thâts* that are in vogue, in the modern forms of these (*Râga*) musics, have been generally retained by the author. There is difference of opinion amongst modern Indian musicians, and theorists, about *Thâts* of *Râgas*. The author has accepted as prevalent *Thâts* what he, by his research, actually found to exist in the vocal and instrumental musics of reputed Indian Musicians. There is disagreement in different Provinces of India, and also within these Provinces, about the forms and *Thâts* of *Râgas*. It should be remembered that the author deals with **Hindustani Music** (of northern India) only, and not of any other type *e.g.* **Karnatic** (which is prevalent in southern India). Besides this modern difference of opinion about *Thâts* of *Râgas*, modern *Thâts* also differ from ancient theory. This will be dealt with hereafter.

Two semitones only in scales (and modes) of author's musics.

All intervals are just natural.

THAT in vogue, has been generally retained.

Modern difference of opinion about THATS. Prevalent THATS of modern Hindustani Music given, as actually found by the author by his research.

In some *Râga* musics, tones other than that of their prevalent *Thâts*, sometimes occur *e. g.* $f\sharp$ in song *Kara Kâma Kaise*, in *Râga Chhâyânat*, having the common scale for its *Thât*. So also in song *Ghari Pala Chhana*, in *Râga Kâlângrâ* (of *Thât* $c, d\flat, e, f, g, a\flat, b$), the natural a in the last but nine bars, is outside the *Thât*. These tones, not within the *Thâts*, are used as accidentals.

Accidentals.

Besides representing songs in the prevalent *Thâts* of their *Râgas*, the author has, in some cases departed from the orthodox practice by transposing the musics to some more convenient scales or modes.§ The theory of these transpositions will be dealt with later on.

In some cases transpositions from prevalent THATS made by author.

* The exceptions to this general rule are the hexatonic and pentatonic *Thâts* already mentioned, and the few *Thâts* identified by the author as *Vikrit Moorchhanâs*, detailed hereafter.

† With a view to prevent this possible confusion with the European scales, the word MODE has been used for *Thât*, (instead of scale major, or minor,) and the scales examplified at pp. 3-5, have been intentionally termed NATURAL SCALES in KEYS of G, D, A, &c. instead of scales of G Major, D Major, A Major &c. It should be noted that the intervals in all these author's *Thâts* (including scales), are natural, as distinct from the European Major and Minor scales, which are generally accepted as tempered scales, the notes of the latter being fixed, not only relatively, but absolutely, in pitch, in different keys.

‡ Other intervals may occur, as already said, as accidentals, or ornamental embellishments, which do not form part of a scale or mode. During modulations, slightly different intervals may occur, at the places where change of Key takes place. By such change of key, the music takes to a new scale. Within this new scale also, the intervals are just natural.

§ Examples of transpositions to *Moorchhanâs* have already been given. The following may be mentioned as examples of transpositions from the prevalent *Thâts* in key C to other keys :—Song *Parabrahma Gobinda*, in *Râga Behâgrâ*, is shown in the prevalent *Thât* of $c, e, f, g, a, b\flat, b$ (d omitted), and also shown transposed to key $E\flat$. Song *Sakhi Kâmpata* in *Râga Jaijayanti* of *Thât* $c, d, d\flat, f, g, a, b\flat$—to key D. Song *Prathama Mâne Onkâra* of the same *Râga* and *Thât*,—to key $E\flat$. Song *Kara Bâdarâ* in *Râga Miâ Mallâr*, having *Thât* $c, d, f, g, a, b\flat, b$—to key $E\flat$. Song *Râjanake Râjâ*, in *Râga Mâlkosh* of prevalent *Thât* $c, e\flat, f, g, a\flat, b\flat$ (*d* is omitted)—to key D.

The modern *Thâts* (modes of *Râgas*) are all based on *sâ i. e.* all are in key C. The *sâ* (*c*), and *pâ* (*g*), the first tones of the tetrachords are immutable, and the other tones are changeable. In the modern Indian system *mâ* (*f*) only, is sharpened, and *ri* (*d*), *gâ* (*e*), *dhâ* (*a*), and *ni* (*b*) are flattened. No other change is recognised in (modern) Indian Music.* This is based on the modern system of tuning, which has already been spoken of, and will be further detailed later on. The prevalent *Thâts* of all *Râgas* (including *Râginis*) are thus in Key C. Where, therefore, amongst the author's musics, a mode (including scales) is found not in key C, it should be understood that the prevalent *Thât* (mode of the *Râga*) has been transposed by the author. To get the prevalent *Thât* the author's music should be re-transposed to key C. All the tones got by this transposition will not, however, form parts of the original *Thât* in every case *e. g.* the tones that are accidentals,† which should be distingnished from the actual tones of the *Thât* (mode). Reference to the prevalent *Thâts* are often made here, as, the belief, that a *Râga* and its *Thât* (always in key C) are inseperable, is so rooted amongst Indian Musicians and theorists, that the transpositions made by the author, from the prevalent *Thâts* in key C, to other keys, or to other modes as spoken above, may not be understood by them. Seeing a *Râga* in a different key or mode, they may not recognise it, and may say that the *Râga* has altered its individual characteristics; or hearing it thus transposed, they may term it another *Râga.*‡ A list of prevalent *Thâts i. e.* the *Thâts* that the author by his research, actually found to exist, appears in Vol. I. The list of prevalent *Thâts* appended in this book, has been taken therefrom, and contains *Thâts* of those *Râgas*, only, that have been exemplified by musics, in this volume.

MA only is sharpened and RI, GA, DHA, and NI only are flattened.

Prevalent THATS are all in Key C. To find out the THAT in vogue, of the author's musics that are not in key C, re-transpose to key C.

Existing belief that a Raga and its THAT in Key C are inseperable.

Reason for disagreement of modern THATS from ancient theory.

It has already been said that there is disagreement of modern *Thâts* from ancient theory. The Sanskrit theoretical works also differ amongst themselves. This is partly due to the change of the shape of the *Râgas* by efflux of time, and also during the Mahommedan influence, and partly to the change in the method of tuning of instruments. I cannot better describe this change than in the author's own words§ :—"The modern *Thâts* do not at all agree with the *Thâts* of *Râgas* as given in ancient Sanskrit books on music.....*Sâ* of ancient music was different from modern *Sâ*, as the former could be *Vikrit* (was mutable). *Grâma,*‖ *Shuddha* (pure) or *Vikrita* (changed from pure or natural form) tones of ancient music, differ widely from modern Indian music. The *Râgas* and *Râginis*, however, that were current in ancient times, do still exist. It is not possible that the medern *Râgas*, which are now expressed in *Thâts* with sharp and flat tones, had no existence in former times. When so many *Râgas* were in vogue then, some of them at least, must have been sung or played in flalt-toned *Thâts* like the modern *Bhairab*, *Bhairabi*, and *Kânârâ*. But these sorts of flat-toned *Thâts* cannot be found within the *Grâmas* of ancient systems. This leads us to the conclusion, that these flat-toned *Thâts* were expressed, at those times, by some other devices. From this it can be surmised that the *Thâts* that are in vogne of flat-toned *Râgas* and *Râginis*, are not their real *Thâts.*"

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* Modern *Thâts* are all based on this system. Thus—the *Thât* of *Râgas Alâhiâ* and *Nata* is the common scale of *c, d, e, f, g, a, b*. The *Thât* of *Râgas Iman, Kalyan*, and *Chhâyânat*, is *c, d, e, f♯, g, a, b*. *Thât* of *Bhupâli* is *c, d, e, g, a*. It is pentatonic. *Thât* of *Bibhâs* is *c, d, e, g, a, b* (hexatonic). *Thât* of *Bâhâr, Arânâ*, and *Bâgasri*, is *c, d, e♭, f, g, a, b♭*. *Thât* of *Mâlkoush* is *c, e♭, f, g, a♭, b♭*. It is hexatonic. *Râgas Bhairabi* and *Gândhâri Tori* have for their *Thât* *c, d♭, e♭, f, g, a♭, b♭* &c.

† As for example—the prevalent *Thât* (in key C), of song *Jhulata Pâtaki* in *Râga Kâmode*, is *c, d, e, f, g, a, b♭*. This music has been shown by the author transposed to key E. The *b♭* of the original key C becomes *d* natural in key E. In the music of the author, *d♯* will be found. This *d♯* is an accidental.

‡ This has been exemplified hereafter.

§ Translated from Gita Sutra Sar, Vol. I, ch. 16.

‖ "*Grâmas* ..may be regarded as collections of notes definitely related to one another by musical intervals.....A grâma might be regarded as a string of notes ranging through three or four octaves. *Intro. to Study of Indian Music* by Clements pp. 2—3. The ancient *Grâma* was not exacly the same as the modern octave, scale, or *Thât*, and the tonal relationship in some of the ancient *Grâmas* was different from that of the modern octaves, scales, or *Thâts*. Grâma in modern times is used to signify an octave, a scale, and sometimes a mode. Thus *târa* grâma means the upper octave.

"These subjects" (theory of transposition), the author says further on,* "have not been considered (in India), as, the learning, of vocal and instrumental music, from notation is not in vogue in Hindusthan. The *Thâts* of *Râgas* that are now found to be prevalent have all been established from the method of playing of the *Vinâ*, *Rabâb*, *Sitâr*, &c. by players of these instruments. They are not so made that *Râgas* &c. may be played by starting from any tone selected *i. e.* from any and every key; on this very account, to fix a position, and to start all *Râgas* from that position, have come in practice, and instead of *ri moorchhanâ*, *ga moorchhanâ*, &c., (which were) the *grâmas* of different tones, being used, sharp and flat-toned *Thâts* have evolved. It is probably due to this, that the ancient method of solfaing of *Râgas* &c. has been changed.†

Pitches of Sharps and Flats though uncertain, the real Modes are not unnatural.

"With the uncertainty in the pitches of sharp and flat notes, with which they are being found to be used amongst singers and players‡, the *Râgas* &c., having *Vikrit*§ tones, with indefinite pitches, could not establish their power of appearing as natural and entertaining. In *Tori*, *Bhairabi* &c. though four out of the seven tones are *Vikrit*, they do not at all sound unnatural, rather they are so pleasing to the general public." The author has suggested in theory and practically exemplified in some of his musics new *Thâts* (modes), in which the uncertainty, of the pitches of the *Vikrit* notes, has been removed. This will be further detailed later on.

Flat-toned THATS are not the real ones. THATS natural to some RAGINIS not yet discovered.

In dealing with these *Vikrit* notes, the author says (*ibid.* p. 207, at beginning of ch. 16):—"While teaching beginners, the solfaing of notes, it is very often seen, that after their practice of the common (natural) scale, and even having a knowledge of the solfaing of notes, it is very difficult for them to practice the sharp and flat tones. From this it is apparent that the sharp and flat-toned *Thâts* are never the natural ones.....But even the uneducated, after hearing songs of sharp and flat notes, do not consider them unnatural, rather, are pleased with them; and students, if taught *viva voce*, without any reference to any notation, easily learn songs of a sharp and flat-toned *Râga*. From this it can be seen that the real *Thâts* of many *Râgas* and *Râginis* have not yet been discovered. What have come in vogue, are not their natural *Thâts*‖; as, had they been the natural ones, beginners could, after easily practising

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* ibid. p. 215.

† The ancient "theories] were founded upon the system of tuning.....(in which)...the chanterelle strings were dhaivat (La), rishabh (Re), and gândhâra (Mi).....Now, the modern system of tuning throughout India has shadj (Do) as the principal drone, accompanied by pancham (Sol) or madhyam (Fa). Not only this, but shadj and pancham are regarded as fixed notes which may never become 'Vikrit', or in other words, sharpened or flattened, and shadj has acquired the privilege of being regarded as the basis of all scales. All Jatis, *(Jâti* means classification through modes) therefore, start from shadj, and all the scales of all the Râgas." *Intro. To Study of Indian Music* by Clements, *p.* 5. Besides the strings meant for *Sâ* (Do), and the chanterelle strings, tuned to *mâ* (Fa) or *pâ* (Sol), there are other strings in Indian instruments, which either serve the purpose of drones, or, are meant for enhancing the sounds of the tones played on the chanterelle strings, by sympathetic vibrations. These strings are also tuned to suit the above *sâ*. When the value of *sâ* is changed, by re-tuning the *sâ* string, (or strings) in order to suit, as already said, a new singer's voice, or for change of keys, all the other strings have to be retuned to suit this new *sâ*.

‡ This has already been spoken of at p. 9.

§ *Vikrit* here means altered from their (*shudh i. e.*) pure forms. "The notes...altered were called '*Vikrit*'. The name 'Vikrit' was extended to any new note obtained by shifting the frets of the solo instruments in use, such as the vinâ and sitâr. Various tuning devices for a change of mode involving a shifting of the frets without retuning the chanterelle or drone strings came to be employed. A great deal of discussion has centered round these 'Shudh' (*i. e.* pure) and 'Vikrit' notes, but for the most part it has been infructuous because the looseness and inaccuracy of the term 'Vikrit' has not been sufficiently grasped." Clements, *ibid.*

‖ Similiar defects of scales, not natural to the musics, and the necessity of correct modes, have been felt in the British Isles also:—"The Modes.—This power of making any one tone of the scale so prominent as to stamp its own character on the whole or any part of a tune, was early felt among all nations, long before what we now call harmony was known. In the old Greek and Latin music there were as many *Modes* of doing this as there are tones in the scale. In each mode special prominence was given to some one tone. Even to the present day the great eastern nations of Persia, India, and China, who dislike our harmony, are exceedingly exact about the correct intonation of the various modes of melody. Much of the old music of Scotland Ireland,

these *Thâts* from notation, thence practice songs. Some may, objecting to this, say that up to date there have been so many celebrated instrument-players and singers, who have played in *Thâts*, which, if not natural, what can they be? To this, the answer is, that numerous examples may be had of many, having not the least knowledge of notation, who have turned out reputed singers and instrument players. They, from childhood, had learnt to sing by rote, like parrots. Again, without knowlede of notation, there cannot be any knowledge of *Grâma*. Thus, how can one say that they had sung in exactly the *Thâts* that are now prevalent?.....

"Those who have settled the solfa notes and *Thâts* of *Râgas* and *Râginis*, might have been versed in tones, but it is doubtful whether they understood *grâmas*." The author here explains in a footnote—"It is no doubt to be admitted that those who now make a record in notation of songs &c., have knowledge of tones; but they, only due to the fact that they are cognisant of the prevalent *Thâts* of *Râgas* &c. from beforehand, find out notations therefrom, (*i. e.* they find out notation by following the prevalent *Thâts*) of songs. That, that knowledge is not sufficient, they themselves will find proof of, when they will find out the sol-fa notes"* (*i. e.* will write down the music) "of unknown *Râgas* sung unaccompanied by the *tâmburâ* or any other instrument; or hearing European band music played and writing some piece of it, in notation, they will compare their record with that of the band music book." (*i. e.* the printed originals). The author continues:—"Amongst the *Râgas* in vogue, *Thâts* of many have not yet been correctly settled. In the *Sitar*, *Râga Khambaj*, played in key F† is designated as *Râga Sindhu*. *Bhairabi*, played and sung in key G, is taken as *Sindhu-Bhairabi*. *Sindhu*, sung in key D, appears like *Bhairabi*; and *Pilu*, sung in key F, resembles *Kâlângrâ*.‡ Sometimes ago particular persons believed, and still many believe, that the key F alone was the natural *Thât* of *Kâlângrâ*. The *ri* and *dhâ* of *Bâgasri*, *dhâ* of *Arânâ* and *Bâhâr*, *dhâ* and *ni* of *Mâlkoush*, are, according to some flat, according to some natural. The *Thât* of *Dhânasri* has not yet been settled, some say its *gâ* is flat like that of *Multâni*, and according to some, it is natural like that of *Sri*..... Professional *Jâtrâ* (indigenous drama) players,.....very often sing flat-toned *Râgas* in natural *Thâts*, no one, nevertheless, consider this as unnatural or unpleasant."

Wales, and England cannot be written as still traditionally sung, except by the use of these modes; and when (as in the case of "Martyrs" in Scotland, "Bangor" in Wales, and other well-known tunes) some musical men, seeking to be wiser than Bach and Handel (who recognised the modes), altered the melody to suit the supposed requirements of modern harmony, and printed these altered melodies, the consequence was that the people either ceased to use the tune or continued to sing differently from the printed copy." "The modes are called by various names: by the Greek, the Latin, the Indian, and the Chinese writers on music". *Standard Course*, by John Curwen, chapter *Time* and *Tune—Fifth Step*. pp. 70—71.

* By "settling sol-fa notes" "finding out solfa notes", and "writing in notation", the author means naming the notes by COPYING BY EAR, and when required, to write the notes in their own indigenous sol-fa system. The indigenous Indian method of teaching and learning *Râga* &c. music is *viva voce*, by repeating words of songs, or by solfaing. For this sol-faing a sort of tonic sol-fa notation has become prevalent in modern times. The pitches of the notes, especially of sharps and flats, of this notation, as already said, are uncertain, and when the music is written down, the time values of notes, especially the subdivisions of a pulse (i. e. of beats within a bar) are also left more or less indefinite in different provinces of India. This defect of notation is not noticed by Indian Musicians, as this music is imparted *viva voce* by solfaing. This defect will be apparent if an unknown, and previously unheard, *Râgini* be reproduced direct from music, written in the prevalent notation. *e. g.* if a Karnatic (of Southern India) *Râgini*, that is not prevelant in Hindusthan (Northern India), and which contains several sharp and flat notes, be selected and required to be reproduced direct from written music (in the prevalent notation), by a Hindustani musician, who has not previously heard the *Râga* sung or played, it will be found that the tune will be altered thereby, and the Hindustani musician will sing something different from what it is actually performed by a Karnatic musician who is conversant with the tune.

† For the method of tuning of the Sitar &c. see p. 2. By this playing in another key, the author means change of key within the instrument without change of tuning. In the *Sitar*, *Esrâj*, *Vinâ*, &c. transition (from key C) to key F, and key G is possible, without change of tuning of the strings.

‡ In this connection, the following experience and criticism thereon, of a compiler of light forms of Indian Music in staff notation, will, I hope, be interesting:—" In fact, the ideal Bhairo is no more to be found than the vast ideal cock, who the Musulmans say stands with his feet on the earth, and his head touching the sky,.....On one occasion a pundit, a paid teacher of music, sang in the writer's presence a tune which he said was a Bhairo. On being asked to sing a Purabi, he sang the same tune, commencing a few notes lower down!" *The North India Tune-Book*, by Mrs. J. D. Bate, *Intro. pp.* viii to xi, North India Tract and Book Society's Depôt, Allahabad; and Alexander and Shepheard, London, Edn. 1856.

The author, tried to discover the correct *Thâts* from *Râgas* actually sung and played by reputed artists. The result of his research has been shown in Chs. 16 and 17 of Vol. I. I shall next deal with the theory of the author's *Thâts.*

Improved Modes Suggested and Introduced by Author.

In the existing practice, based on key C, numbers of *Thâts* have come in vogue. "Raja Saurindra Mohan Tagore", and his school in Bengal, "by permutation and combination of" sharp and flat "tones, and of "pentatonic and hexatonic scales," all in key C, "have formed and shown" in their theoretical works. "more than one hundred and fifty *Thâts*, and have spoken of them as necessary for Indian Music." "These", according to the author, "are neither necessary nor are they used in Indian Music, and by such a number of *Thâts* Rajah Tagore, and his school have only created a confusion."* By practice, and the present system of tuning, this belief in the necessity of numerous *Thâts*, and of all *Thâts* to be based on key C, has become so rooted amongst Indian Musicians and Theorists, that the improvements introduced and suggested by the author, may not be understood by them. A short explanation on the author's methods, is therefore necessary. Examples of identifying by the author, of modern *Thâts* with ancient *Moorchhanâs* have already been given. By this transposition to *Moorchhanâs* and to keys other than key C, the author has considerably reduced the number of *Thâts*, and thereby has suggested and practically exemplified in his musics more rational modes. I give the author's theory in his own words (*ibid.* p. 208): "It is true that *Thâts* of *Râgas* cannot often be had from the *Moorchhanâs* that are assigned for *Râgas* and *Râginis* in ancient Sanskrit books. This is partly due to the defect of writings in these books, and partly to the change from the ancient form of the *Râgas*, (*Raginis*) &c. What a fine resemblance exists between *moorchhanâs* and prevalent *Thâts* is shown below :—

THATS reduced in number by author.

1. *sâ* (Do) – *ri* (Re) – *gâ* (Mi) + *ma* (Fa) – *pâ* (Sol) – *dhâ* (La) – *ni* (Si) + *sâ* (Do) { Natural *Thât.* / *sâ moorchhanâ* (Do mode).

2. *sâ* (Do) – *ri* (Re) + *gâ* (Mi)♭ – *mâ* (Fa) – *pâ* (Sol) – *dhâ* (La) + *ni* (Si) ♭ – *sâ* (Do)—*Thât* of *Sindhu.*†
   ri (Re) – *gâ* (Mi) + *mâ* (Fa) – *pâ* (Sol) – *dhâ* (La) – *ni* (Si) + *sâ* (Do) – *ri* (Re)—*ri moorchhanâ* (Re mode, or Authentic Dorian).

3. *sâ* (Do) + *ri* (Re) ♭ – *gâ* (Mi) ♭ – *mâ* (Fa) – *pâ* (Sol) + *dhâ* (La) ♭ – *ni* (Si) ♭ – *sâ* (Do)—*Thât* of *Bhairabi.*
   gâ (Mi) + *mâ* (Fa) – *pâ* (Sol) – *dhâ* (La) – *ni* (Si) + *sâ* (Do) – *ri* (Re) – *gâ* (Mi)—*ga moorchhanâ* (Mi Mode or Phrygian).

4. *sâ* (Do) – *ri* (Re) – *gâ* (Mi) – *mâ* (Fa)♯ + *pâ* (Sol) – *dhâ* (La) – *ni* (Si) + *sâ* (Do)—*Thât* of *Iman.*
   mâ (Fa) – *pâ* (Sol) – *dhâ* (La) – *ni* (Si) + *sâ* (Do) – *ri* (Re) – *gâ* (Mi) + *ma* (Fa)—*ma moorchhanâ* (Fa Mode or Authentic Lydian).

5. *sâ* (Do) – *ri* (Re) – *gâ* (Mi) + *mâ* (Fa) – *pâ* (Sol) – *dhâ* (La) + *ni* (Si) ♭ – *sâ* (Do)—*Thât* of *Jhinjhoti.*
   pâ (Sol) – *dhâ* (La) – *ni* (Si) + *sâ* (Do) – *ri* (Re) – *gâ* (Mi) + *mâ* (Fa) – *pâ* (sol)—*pa moorchhanâ* (Sol Mode or Mixo Lydian).

6. *sâ* (Do)—*ri* (Re) + *gâ* (Mi) ♭—*mâ* (Fa)—*pâ* (Sol) + *dhâ* (La) ♭—*ni* (Si) ♭—*sâ* (Do)—*Thât* of *Kânârâ.*
   dhâ (La)—*ni* (Si) + *sâ* (Do)—*ri* (Re)—*gâ* (Mi) + *mâ* (Fa)—*pâ* (Sol)—*dhâ* (La)—*dha moorchhanâ* (La Mode or Æolian).

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* Gita Sutra Sar, Vol. I. Ch. 16, p. 210 foot-note.

† Modes 2, and 4 to 6, have already been mentioned. They are reproduced here to show in one place, the small number of *Thâts* (Modes), in which the author has reduced the prevalent *Thâts.* Similiar to that done at p. 9 *sâ, ri, gâ, mâ* &c. have been translated here as Do, Re, Mi, Fa, &c., as the pitches of these tones are not *absolutely* fixed in the different Modes. Like that at p. 14, sign + denotes semitones. Sign—is meant for a whole tone (which includes major and minor intervals.)

7. *sâ* (Do)+*ri* (Re)♭—*gâ* (Mi)♭—*mâ* (Fa)+*pâ* (Sol)♭—*dhâ* (La)♭—*ni* (Si)♭—*sâ* (Do)—Not current.
ni (Si)+*sâ* (Do)—*ri* (Re)—*gâ* (Mi)+*mâ* (Fa)—*pâ* (Sol)—*dhâ* (La)—*ni* (si)—*ni moorchhanâ* (Si Mode or Plagal Phrygian).

"The above *ni moorchhanâ*, might appear to have been the *Thât* of *Darbâri Tori*, which might have changed in modern times. Besides these, the few *Thâts* that still remain, may be accomplished by *Vikrit* moorchhanâs*, thus :—

1. *sâ* (Do)+*ri* (Re)♭+— *gâ* (Mi)+*mâ* (Fa)—*pâ* (Sol)+*dhâ* (La)♭—*ni* (Si)♭—*sâ* (Dó)—*Thât* of *Bhairab*.
gâ (Mi)+*mâ* (Fa)+—*pâ* (Sol)♯+*dhâ* (La)—*ni* (Si)+*sâ* (Do) —*ri* (Re)—*gâ* (Mí)—*Vikrit ga moorchhanâ*.

2. *sâ* (Do)+*ri* (Re)♭+— *gâ* (Mi) +*mâ* (Fa)—*pâ* (Sol)+*dhâ* (La)♭—+*ni* (Si) +*sâ* (Dó)—*Thât* of *Kâlângrâ*.
gâ (Mi)+*mâ* (Fa)+—*pâ* (Sol)♯+*dhâ* (La)—*ni* (Si) + *sâ* (Do)—+*ri* (Re)♯+*gâ* (Mí)—*Vikrit ga moorchhanâ*.

3. *sâ* (Do)—*ri* (Re)+*gâ* (Mi♭)—*mâ* (Fa)—*pâ* (Sol)+*dhâ* (La)♭+—*ni* (Si) +*sâ* (Dó)—*Thât* of *Pilu*.
dhâ (La)—*ni* (Si)+*sâ* (Do) —*ri* (Re)—*gâ* (Mi)+*mâ* (Fa) +—*pâ* (Sol)♯+*dhâ* (La')—*Vikrit dhâ moorchhanâ*.

4. *sâ* (Do)+*ri* (Re)♭—*gâ* (Mi)♭—+*mâ* (Fa)♯+*pâ* (Sol)+*dhâ* (La)♭—*ni* (Si)♭—*sâ* (Dó)—*Thât* of *Darbâri Tori*.
gâ (Mí)+*mâ* (Fa)—*pâ* (Sol) — *dhâ* (La)♯+ *ni* (Si)+ *sâ* (Do)—*ri* (Re)—*gâ* (Mí)—*Vikrit ga moorchhanâ*.

5. *sâ* (Do)+*ri* (Re)♭—*gâ* (Mi)♭—+*mâ* (Fa)♯ +*pâ* (Sol)+*dhâ* (La)♭—+*ni* (Si) +*sâ* (Dó)—*Thât* of *Multâni*.
gâ (Mi)+*mâ* (Fa)—*pâ* (Sol)—+*dhâ* (La)♯ +*ni* (Si)+ *sâ* (Do)—+*ri* (Re)♯+*gâ* (Mí)—*Vikrit ga moorchhanâ*.

"*Sri, Gauri, Purabi, Paraj*, &c. *Râgas* are performed by *Vikrit sâ moorchhanâ*, and what are their prevalent† *Thâts*, are the natural ones. *Moorchhanâs*, again, are of three sorts, *Auraba*, *Khâraba* and *Sampurna*.‡ *Hindol* (1), *Bhupâli* (2), *Brindâbani Sârang* (3), &c. *Râgas*, are the products of *Auraba sâ moorchhanâ*. *Lalit* (4), *Vasanta* (5), *Megha* (6), *Mâroâ* (7), *Puriâ* (8), &c. *Râgas*, are produced from *Khâraba sâ moorchhanâ*."

In addition to the above the author gives the following :—

"*sâ* (Do)+0—*gâ* (Mi)♭—*mâ* (Fa)—0+*dhâ* (La)♭—*ni* (Si)♭—*sâ* (Dó)—*Thât* of *Mâlkoush*.
gâ (Mi)+0—*pâ* (Sol)—*dhâ* (La)—0+ *sâ* (Do) —*ri* (Re) —*gâ* (Mí)—*Auraba ga moorchhanâ*."

Here 0 indicates the omitted tones.

"With the *Thâts*, indicated above, hundreds and thousands of *Râga* and *Râgini* musics can be written. The theory of new *grâmas* (the author means by it, his modes) for writing down *Râgas* &c., that has been established, in this way, agrees well with the ancient theory of Hindu Music. If there be any practical meaning of *moorchhanâ*, then the above alone, seems to be its proper application. If, some one discovers another correct meaning of *moorchhanâ*, in that case, there will be only no concord of the (above) suggested theory, with the (meaning to be discovered of the) ancient system ; but that will in no way harm the (utility of) the above theory.....

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* For meaning of *Vikrit* see p. 17 foot note.

† Prevalent *Thât* of *Sri, Gauri*, and *Paraj* is *c, d♭, e, f♯, g, a♭, b*, that of *Purabi* is *c, d♭ e, f, g, a, b*, and also *f♯* is used.

‡ *Auraba* = pentatonic, *Khâraba* = *hexatonic*, *Sampurna* = containing all the seven tones (see p. 13)

(1) Having *Thât*, *c, e, f♯ a, b*. (2) *c, d, e, g, a*. (3) *c, d, f, g, b*. (4) *c, d♭, e, f, a, b*. (5) *c, d♭, e, f, a, b* & *f♯*, is also used. (6) *c, d, e, f, g, b*. (7) *c, d♭, e, f♯, a, b*, (8) *c, d♭, e, f♯. a, b*.

"The *Râginis* that are being sung in *Thâts* with *gâ॒* (Mi॒) and *nî॒* (Si॒), such as *Sindhu*, *Kâfi*, *Sahânâ*, *Arânâ** &c., of these, the natural scale is their real *Thât*, only, they begin and close in *ri* (Re),† —what, according to the ancient system, is called *Graha* and *Nyash*. This meaning only, appears to be the rational one for *Graha* and *Nyash*, otherwise we cannot understand what else they may mean. In these very *Râginis ri* (Re) is *Bâdi*, and *dhâ* (La) *Sambâdi*. In this way also the meaning and utility of *Bâdi*, *Sambâdi*‡ &c. may be recognised. To keep *dhâ* (La) in agreement with *ri* (Re), in these very *Râginis*, *dhâ* (La) has to be raised a degree,§ otherwise it does not become full *Sambâdi* (true major fifth) of *ri* (Re). These sorts of *Râgas* may be called *Râgas* of *ri moorchhanâ* or *ri Thât*" (*ibid.* p. 211)....."In this manner...some *Râgas* are of *ga Thât* (Mi Mode), some of *pa Thât* (Sol Mode), and some of *dha Thât*" (La Mode) *ibid.* p. 212. For Mi, Sol, La &c. Modes see pages 19 & 20.

GRAHA (ग्रह). NYASH (न्यास). BADI (वादी). SAMBADI (संवादी).

* Their prevalent *Thât* is *c*, *d*, *e॒* *f*, *g*, *a*, *b॒*.

† The author means that their real *Thât* (mode) is Re, Mi, Fa, Sol, La, Si, Do.

‡ *Graha—swara*, according to some Sanskrit authorities, means the tone in which the *Râga* begins, and *Nyasha swara*, the tone in which the *Râga* ends. According to the Sanskrit book *Sangit Ratnâbali* (quoted by the author amongst other texts in Vol. I, Ch. 12 p. 121), "*Bâdi* is like the king amongst the tones of a *Râga*, *Sambâdi* is like the minister, *Anubâdi*, like the valet, and *Bibâdi* is like the enemy." The author, quoting *Someswar* continues, "some give to the *Bâdi* tone, another name—ANSHA." The modern system of having all *Thâts* in key C, has led to much confusion in the meaning of these technical terms, and different commentators have put various interpretations to these words, most of which do not at all tally with practical (Indian) music. This has been discussed by the author in Vol I. chs. 9 and 12. The above interpretations, of these technical terms, as suggested by the author, seem to be the rational ones. With this meaning of BADI may be compared to:—The "GOVERNING NOTE or Key NOTE", of the European system, which is "characteristically heard ..... and causes all the other sounds to acknowledge (him as) a .....ruler or sovereign;..... to minister in their places around him". *Grammar* by John Curwen, *Sec. viii*, also *Standard Course* I, iv, 47. In this sense of the author, SAMBADI, is similar to the DOMINANT tone, ANUBADI signifies a sense similiar to CONCORDANT, or CONSONANT, and BIBADI to the DISSONANT or DISCORDANT, of the European system.

§The theory of raising or lowering by a degree has been detailed by the author in Vol. I. This has been taken by him from the European theory of dividing the octave, approximately (though not with mathematical accuracy), into 53 degrees, of which 9 degrees form the major interval, 8 degrees, the minor interval, and 5 degrees, the semitone interval. (See General Perronett Thompson's *Exercises* and *Just Intonation*, Dr. Crotch's *Elements*; and John Curwen's *Grammar*, and *Standard Course*. For major, minor, and semitone intervals, the *Standard Course* uses the terms Great, Medium and Little steps, respectively.) In this division, the major fifth (as from Do to Sol) is 31 degrees. In the common scale La (*a*) is, however, 30 degrees from Re (*d*). Thus, La has to be raised a degree to make it a (just major) fifth (*i.e.* 31 degrees) above Re. Similiar to this raising a degree, there exists the theory in India of raising or lowering by a SRUTI. Much importance is given to these *srutis* by Indian Musicians. They say, that *srutis* are 22 minute subdivisions of the octave, existing in Indian Music, giving third, quarter, and other microtones, and that as these microtones do not exist in European Music, and not represented on the staff, the staff-notation is quite unsuitable for Indian Music. As this, and a good deal of similiar other misconceptions exist about *sruti*, it is hoped that some explanation of *srutis* would not be out of place here, in connection with the allied division, as mentioned above, of the octave into 53 degrees. The existing fallacies about *sruti*, and the rational interpretation of its meaning arrived at by the author, has been detailed by him in Vol. I. His main conclusions are:—that **SRUTIS** are intervals, and not tones, meant for explaining the measures of intervals between tones, of different Indian Modes; that by srutis the octave is not divided into 22 tones; that there are no third, quarter, or such other microtones in Hindustani Music, and that there are also no intervals in this music which is un-known or not used in Europe; that srutis are rough and un-equal measures of intervals, of which four srutis are meant for the major interval, three srutis for the minor interval, and two srutis for the semitone interval; that srutis are not equal divisions of the octave. (Vol. I. Ch. 3 pp. 16, 17, 26 *et seq.*) Besides finding some irregular scales, Mr. Deval, by his research, (as shown in his book, *The Hindu Musical Scales and Twenty Two Srutis*, Arya Bhusan Press, Poona), from experiments on musics played and sung by reputed Indian artists, has recently come practically to the same conclusions as that of the author, as mentioned above. We may see that a just major interval, (represented approximately, as shown above, by 9 degrees), is not exactly twice the just semitone interval (of 5 degrees). Thus a four sruti interval, (which, as shown above, is the Indian method of depicting the just major interval), is not exactly double the two sruti interval (the just semitone). Similiarly a three sruti interval (just minor interval of 8 degrees) is not exactly one and a half times the two sruti interval (just semitone). **Srutis are thus rough, and unequal divisions.** Any correct or approximate value of each sruti cannot be deduced from ancient Indian theoretical works or modern commentaries. Recently, following the experiments of Mr. Deval, Mr. Clements, in his *Intro. to the Study of Indian Music* (Longmans, Green & Co. 1913), has given a table showing the vibration numbers for the pitch of each sruti, and has shown how different groups of them form different Indian Modes. Mr. Clements also, (in addition to the sharp and flat signs), by introducing some sloping lines, and adding sloping lines, to the existing sharp and flat signs, has depicted on the staff, the notation for each sruti. The theory of these vibration numbers (for each sruti), is however, not clear from his book. Had the srutis been *absolutely* fixed in pitch, the practical utility of Mr. Clements's method of assigning a note, on the staff, for each sruti could have been intelligible. Mr. Clements himself, has given different vibration numbers for the pitches of individual srutis, for different modes (at p. 77 *et seq.* of his book)

SRUTI.

Staff-Notation of Mr. Clements, and of author compared.

"*Bhairabi* is *Râgini* of *gâ Thât* (Mi Mode). The natural tones form its actual *Thât*. *Gâ* (Mi) is its *Ansha*, *Graha*, and *Nyash*; i.e. this *Râgini*, passing through ascensions and descensions, rests and closes on *gâ*" (Mi) *ibid*. p. 213.

New tunings of TAMBURA suggested by author to accompany his THATS.

The author has suggested the new *Thâts* discovered by him not only with a view to reduce the number of *Thâts* that are prevalent, but also for purpose of better record. In propounding his *Thâts*, the author had also an eye to the record of Indian *Râgas* in more convenient and natural modes, for the purpose of singing and playing direct from notation.* To avoid the *tamburâ*, in its prevalent tuning, appearing discordant and inconvenient, the author has suggested (in Vol. I ch. 13) new forms of tuning the *tamburâ* for accom- panying his *Thâts*, and has exemplified this tuning in some of his musics that are to be found in this book.

He also accepts the theory of Indian Musicians, that srutis are not limited to 22, but are more numerous. (*ibid*. p. 14) Thus, like the tones of modes, the srutis themselves are not *absolutely* but *relatively* fixed in pitch, for different Modes. When these variable values of the notation signs for individual srutis have to be kept in view, it is not easy to understand the necessity for overburdening the staff with new signs for srutis, as Mr. Clements has done. The (Gita Sutra Sar) author's method, of adapting the staff-notation for Indian Music, is far simpler. He uses, as has already been explained, the ordinary staff notes, for different Modes of Indian Music, and to suit Indian purposes, assigns that the notes are not *absolutely* fixed in pitch for each and every Mode, but have fixed relative values in an individual mode. On this account, and due to the fact that the author's method accords more with Indian theory and practice (in practice both the natural and sharp or flat forms of the notes are solfaed by the natural sol-fa names *sâ, ri, gâ mâ, pâ, dhâ, ni, sâ*, *e.g.* both Fa and Fa♯ are solfaed as *mâ*, though done so in different pitches. The tones of the notes, as already said, are also accepted as variable in *absolute* pitch in different Modes), the staff-notation, (without any addition to the signs for notes), as used by the author, is likely to be more easily understood by Indians. It has already been mentioned, that according to the author, there are no intervals in Indian Modes, that are unknown or not used in Europe. It should be understood here that the author deals only with Hindustani Music, which was the court Music of Upper India and not with local folk-songs, in which irregular scales (see p. 6 foot-note) may be found to exist. Mr. Deval has spoken of some irregular scales, and Mr. Clements has given some Modes.

Suggestions for depicting New Intervals, if any.

with a new interval, the septimal interval. Mr. Clements, however, does not give any practical example of music, embodying this new interval. His book, in fact, contains no practical (Indian) music, exemplifying his theory. His opinions are based on experiments on a single musician only. If any new interval be actually found to exist as part of a mode, and not merely as an ornamental embellishment, or as the peculiarity of a particular musician, for such new intervals, no new signs on the staff, need be introduced. They may be represented by depicting the Indian notes (*sâ, ri, gâ, mâ, pâ, dhâ, ni, sâ*) by the ordinary signs on the staff, as the author has done, and, like him stating that the intervals between the notes are not *absolutely* fixed, as in the standard scale, but have fixed relative values in a Mode. In cases of new intervals, if any, in a particular Mode, the values of these new intervals may either be given as a heading, or mentioned in a separate place. The rational interpretation of the Indian theory of lowering or raising by a sruti, seems to be what is meant by the author, in the similiar method of lowering or raising by a degree, as mentioned above. Similiar altering of tones is also recognised in Europe—*cf.* "If **lah** (La) be wanted to agree with the acute **ray** (ordinary Re) of the first sharp key (key D) it may be called **lay**", which is one degree higher than La. *Standard Course*, by J. Curwen I, vi, p. 112. What is meant is—that a tone a degree higher than ordinary La (*i.e.* than La of common scale) is required, to make it agree with (*i.e.* to become true fifth of) Re (the key-tone of key D). This comes to the same thing as raising *dhâ* a degree, as spoken above. Again—"When the tone **r** is required to tune with **f** (as **m** tunes with **s**, and **l** with **d'**), and when it is required to tune with **l** (as **d** tunes with **s**, and **f** with **d'**), the ears of singers, and of quartet players on stringed instruments, naturally seek to produce the **r** (Re) a little lower than when it is required to tune with **s** (Sol) and **t** (Si).....this lower or 'grave' form of **r** (Re)," is a degree lower than ordinary Re (*i.e.* Re of the common scale). (*ibid*. p. 111). "It . ...accounts for many disagreements between the voice and the piano or organ, those instruments being tuned upon the 'equal temperament' system, which divides the octave into twelve semitones an equal distance apart, and thus making every interval, with the exception of the octave, more or less out of tune" (*ibid. ante*). If learnt from a teacher, and not practised from these tempered instruments, (in which the harmonium is also included), the 'grave' Re or raised *dhâ* (La), though appearing difficult in theory, can easily be vocalised, or played on free-toned instruments, when intonated, in relations of just intervals with other tones.

Altering a tone by a degree &c. is also recognised in Europe.

Tempered instruments out of tune with voice.

*These suggested *Thâts* of the author should not, however, be considered as the last word for improvement. The author himself says, (as already quoted from him see p. 17) that the proper Modes, natural to the melodies of some existing *Ragâs* have not yet been discovered. Thus, modern research may bring to light more natural, and therefore more suitable Modes of these *Râgas*. The author has discovered, that unknown and unrecognised by Indian Musicians, modulation actually exists in their musics. This will be dealt with later on. In the light of this discovery, better Modes, or analysis of Modes into their component scales, and better ways of writing down some of these *Râgas*, may be found out.

All musics not written by author in his THATS. The author has not written all his musics in the new *Thâts* suggested by him, as, in his opinion, in the present system of tuning of the *Vinâ*, *Sitâr*, *Esrâj* &c. (as already said, always in key C), it would be inconvenient to play musics in these new *Thâts*. **Transitions in** these **Indian stringed instruments** are, however, **possible to Key F and Key G, without retuning.** The author has, therefore, written and shown some of his musics in his *Thâts*, that are in these keys. As regards his suggested *Thâts* in other keys, and *moorchhanâs* (modes), he has practically exemplified their application in a few musics only, by way of illustration. To suit the method of tuning of Indian stringed instruments, the author has generally written his musics in Key C, and where considered necessary, as already explained (see p. 11 foot-note), has mentioned at the heading the key, by transposition to which, the music may be conveniently sung. For purpose of accompanying instruments, these headings such as key D, key E &c. mean that the strings meant for the middle *sâ* of these Indian instruments are to be tuned to middle *d*, *e*, &c. of the standard (common) scale.

Musics generally given in Key C. In some cases value of middle SA (Do) given at the heading as Key D, Key E &c.

Besides thus showing at the heading the value of the middle *sâ*, the author, as already said, has transposed some of his musics, from key C, to other Keys and Modes. For this purpose he has used the key signatures of the staff-notation. From the mere appearance of these key signatures, it should not, however, be assumed that the scales are tempered ones, as is the general significance of these key signatures in Europe. The author has adopted these key signatures to suit the just (natural) intervals of Indian Modes. For example, in the scales exemplified at pp. 4 & 5, though the key signatures have been used, the intervals, none the less, (as already explained), are just (natural) in all of them. In cases of transpositions made by the author, the key signatures would indicate the keys to which the musics have been changed from (their prevalent forms in) key C. In some musics, it would be found, that besides key signatures, accidental signs have been used. In these cases the author has intentionally used the key signature to indicate the key-tone, and, when felt necessary, for some tones of the mode, or for accidental tones, has used accidental signs in the body of the music. For example, the song *Jhulata Pâtaki*, has been transposed to key E. The ordinary tones in this key are *e*, *f*♯, *g*♯, *a*, *b*, *c*♯, *d*♯, *e*. The song is in *Râga Kâmode*, whose prevalent *Thât* is *sâ*, *ri*, *gâ*, *mâ*, *pâ*, *dhâ*, *nî*♭, *sâ*, or *c*, *d*, *e*, *f*, *g*, *a*, *b*♭, *c*. This *Thât* transposed to key E, becomes, *e*, *f*♯, *g*♯, *a*, *b*, *c*♯, *d*, *e*. Thus, in this change to key E, *nî*♭ becomes natural *d*, and not *d*♯, as is the ordinary tone of key E. This music could have been written by placing at the signature, the sharp signs for *f*, *g*, and *c* only, but these three sharp signs would have indicated the music to be in key A and having *a* for its key-tone, instead of key E, with key-tone *e*, as intended by the author. To prevent this confusion, and for easy recognition of the key-tone, the author has used all the four sharps of key E (including the sharp sign for *d*), in the signature, and for *nî*♭ of the *Thât*, he has used the natural sign before *d* in the body of the music. In some places, in this music, it would be found that both *d* natural and *d* sharp have been used, and in some bars there are no natural signs against *d*. *d* sharp in these cases, is natural *ni* (see scale in key of E, p. 5), and as the *Thât* contains *nî*♭, and *ni* natural is outside the *Thât*, it is to be understood that *d* sharp (or *ni* natural) has been used in the above instances as an accidental.

Key signatures as adopted by the author.

Author's suggestions for writing down THATS by key signatures. The author has shown (Vol. I. ch. 17, p. 220) that some out of the *Thâts* suggested by him, and some prevalent *Thâts* also, can be transposed, and also be written, by key signatures. Thus, according to him *Râgas Sindhu*, *Sâhânâ*, &c., containing, besides other natural tones, *e*♭, and *b*♭, in their prevalent *Thâts*, may be transposed to key B♭. This will be apparent from the fact that in key B♭ (see p. 5), *e* and *b* only are flats, and the other notes are natural. The author goes on, "The *Thât* of *ga moorchhanâ* (Mode Mi, Fa, Sol, La, Si, Do, Re), if written in key A♭, leads to the *Thât* of *Bhairabi*". This has already been shown (see p. 14). In this manner *ma moorchhanâ*, derived by the author from prevalent *Thât* of Do, Re, Mi, Fa♯, Sol, La, Si, Do, (see p. 19) may be written in key G. The above *Thât*, is also the prevalent *Thât* of *Râga Iman*. In it Fa or *f* only is sharp. In key G also, *f* only is sharp (see p. 4). Thus, in key G, we get the prevalent *Thât* of *Iman*.

Similiarly *Thât* of *Kânârâ*, (in which Mi, La, and Si, or *e*, *a*, and *b* are flats, see p. 19), may be written in key E♭. It will be seen (p. 5) that key E♭ has also these three flats. The author has given practical examples of such transpositions, and of writing of musics, by key signatures. Transposition of *Bhairabi* to key A♭ has already been mentioned (see p. 14). As another example, may be mentioned, song *Hajarata Gausalâ* in *Râga Darbâri Kânârâ*, (in which *e*, *a*, and *b* flats), that has been shown in key E♭.

Modulations in Indian Music discovered by author.

The author, with his knowledge of the European system, a rare qualification for Indian Musicians, has by his research brought to light a valuable data, in the light of which, if existing musics as practically sung and played by good Indian Musicians, I mean those, "whose art has not been contaminated by the (tempered) harmonium"* be analysed, a more rational interpretation than what now exists, may be arrived at for purpose of classification, and record in writing, of these musics. I quote the author's theory in his own words† :—"There are many *Râgas*, which, now and then, leaving the key of C acknowledge a new tone as the key-tone, and afterwards returning to key C, ends in it. This is called **Shadaj-sankraman** (**षडज संक्रमण**). As for example—*Iman Kalyan* through *mâ* sharp (*f*♯) passes to key G, Thus :—

"This, beginning in key C, during descension, through *mâ* sharp (*f*♯) passes to key G, at (*p*)..... .....and...again, when *mâ* (*f*) natural is sung, as at (*q*), it, leaving key G, returns to key C and ends in it.‡.....This sort of transition is seen in (*Râgas*) *Belâbali*, *Behâg*, *Gaursârang*, *Hâmbir*, *Purabi*, *Gauri*, &c. *i.e.* they generally modulate to key G. It is not, however, a fact that every *Râga*, having *f*♯, will modulate to key G. *Iman*, (it is different from *Iman Kalyan*), having no *mâ* (*f*) natural, cannot be said to modulate to key G (from key C). G is its proper key-tone, and for this reason it can be called a *Râga* of *mâ moorchhanâ*." For this relation of G key and *mâ moorchhanâ*, see p. 23. "In several *Râgas*, *Kari* (*i.e.*) sharp *mâ* (*f*♯) is used as an accidental only, as in *Purîâ-dhanasri*, *Paraj*, *Vasanta*, &c. Modulations to key G, cannot be said to take place in them."

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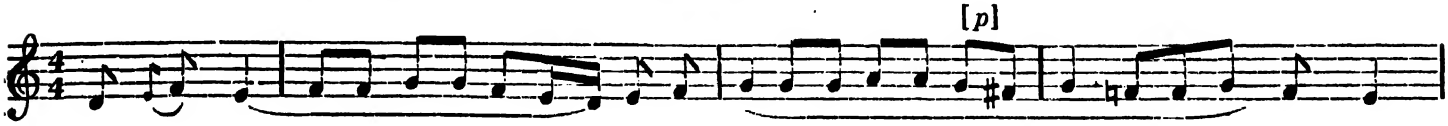
* *Clements ibid.* p. 3, *cf.* also, "Habitually singing with 'tempered' instruments, with their flat fifths, and sharp thirds, put...the ear out of tune." Curwen's *Standard Course*, II, v, 161.

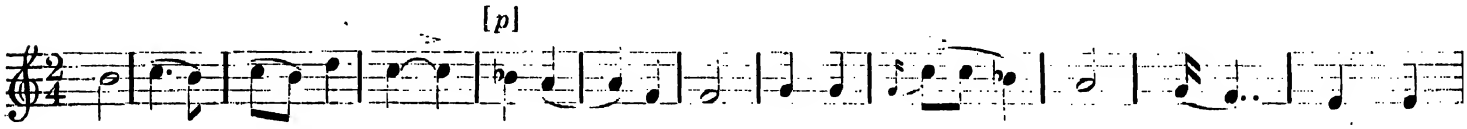
† Translated from Gita Sutra Sar Vol. I, ch. 17 &c. where the subject is dealt with in more detail.

‡ In the Indian method of sol-faing both *f* and *f*♯ are uttered as *mâ*, though in different pitches. Thus the bar at (*p*) and the one just before would be sol-faed as—*gâ ri—gâ | mâ—pâ | —mâ |*. The same near (*q*) would be uttered as—*gâ ri—gâ | gâ mâ—gâ ri |*. In the indigenous system of learning, which is *vivâ voce* from a teacher, the notes are sounded in their proper pitches, unconsciously of any transition. For demonstrating the value of the notes, and for solfaing direct from notation, the following method may be found useful:—"In transition the music should pass out of the old key through some note which is convertible into a note of corresponding pitch in the new key. Thus we may pass into the SOH (Sol) KEY through the note ME (Mi), which is convertible into the LAH (La) of the new key, or through SOH (Sol) convertible into DOH" (Do), &c....."The 'convertible' note, from which transition is taken, should be indicated, in solfaing, by pronouncing the syllable name it bears in the old key together with that which it takes in the new. Thus ME converted into LAH of the new key would be pronounced M'LAH—DOH converted into SOH, D'SOH," &c. *Grammar* by J. Curwen sec. viii. "The manner of showing the passing from one key to another is by giving to some tone closely preceding the distinguishing tone a double name, pronouncing the old name slightly and the new name emphatically, thus *s'doh*, *m'lah*, *d'fah*, &c." *Standard Course* I, iv, 49. By this method the above bars near (*p*) may be solfaed as :—*gâ ri—g'dhâ | ni —sâ | —ni. |* This will be apparent if we notice, that *f*♯ is *ni* (Si) and *g* is *sâ* (Do) in key G. (see p. 4). The bars near (*q*), similiarly to the above, may be solfaed as :—*dhâ pâ—dh' gâ | g'mâ—gâ ri |* &c. By this methed the proper pitches of the notes would be easily grasped and intonated by a student.

"*Râgini Khâmbâj* sometimes modulates to key G, through sharp *mâ* (*f*♯), as for example in the following *Tappâ** song (*Bhâlâbe Jâti Jôre*) by Sôri Miâ:—



It, beginning in key C, has through sharp *mâ* (*f*♯) passed to key G at [*p*]; otherwise, the use of sharp *mâ* in *Khâmbâj* is not justified. Afterwards through natural *mâ* (*f*) it has returned to key C. Some may say that the above sharp *mâ* (*f*♯) is incorrect, but really that is not the case, as the same is heard sung, by renowned singers and songstresses. It is not therefore, inaccurate..... In *Thungrit* songs this sort of transition is often seen to exist..... With the *komal ni* (*b*♭) that is used in *Khâmbâj*, through that very tone, this (*Râgini*) modulates to key F, as for example (in song *Bangshi Dhuna*):—



This song, beginning at first with natural *ni* (*b*) in key C, has, at the place marked [*p*], through *komal ni* (*b*♭), passed to key F. Some may say that natural *ni* (*b*) is incorrect, and that it should be nothing but *komal ni* (*b*♭); but that is not so. Hindustani singers, as a rule, sing like that (in *b* natural). To make a grammatical rule according to one's own liking, such as—natural *ni* (*b*) should not be used in *Khâmbâj*, would not do. What is in general practice should be looked into. *Surat*, *Desh*, *Kâmode* &c. also, through both *nis* (*b* and *b*♭) modulate to F and C keys. As a special proof, that *Râgas* employing *komal ni* (*b*♭), modulate, by stepping through the *nî* (*b*♭), to key F, may be had from the fact that in *Râgas* containing *nî*, the tone *mâ* (*f*) is not found to be omitted. In *Jhinjhôti* such modulation do not take place. It is a *Râgini* of *pa moorchhanâ* (Sol mode) which has been mentioned before. .....

"*Sindhu*, *Kâfi*, *Bhimpalâshi*—these (*Râgas*), like *Khâmbâj*, through natural *ni* (*b*), modulate to key C. This is specially the case in the *antarâ*.‡ After this, through the use of *komal ni* (*b*♭), leaving key C, they take to another key. That, the other key is F, could not be readily said, as, below this *ma* (*f*), with the difference of a whole tone, *komal gâ* (*e*♭) appears; but, strange to say, as if for complete transition key F, *natural gâ* (*e*) occurs in these *Râginis* now and then, and by this their beauty is much enhanced. To see this, the musics of songs in these *Râginis*, (of this book) should be referred to.

"In *Kedârâ*, besides key C, there is modulation to two other keys—F and G. First, through *gâ* (*e*) it takes to key F, then through *kari mâ* (*f*♯) it modulates to key G; lastly, through natural *mâ* (*f*) and *ri* (*d*) it terminates in the key of C. .....

"From this it is evident that *Râgas* **largely modulate to keys F and G.** This is due to the fact that **transitions to these two (key) tones are easy and natural.** Probably on this account (for transition to keys F and G, without retuning) there has been the necessity of, and the use of, separate frets for *kari ma* (*f*♯) and *komal ni* (*b*♭), in the *Sitâr* and other instruments, otherwise there would have been much disadvantage. Modulation to other keys, besides these, is not so easy.

"In some particular *Râgâs* modulation to other keys also takes place. ..... There is another sort of modulation, in which, through a tone, a semitone higher,.....(transition is produced).....and

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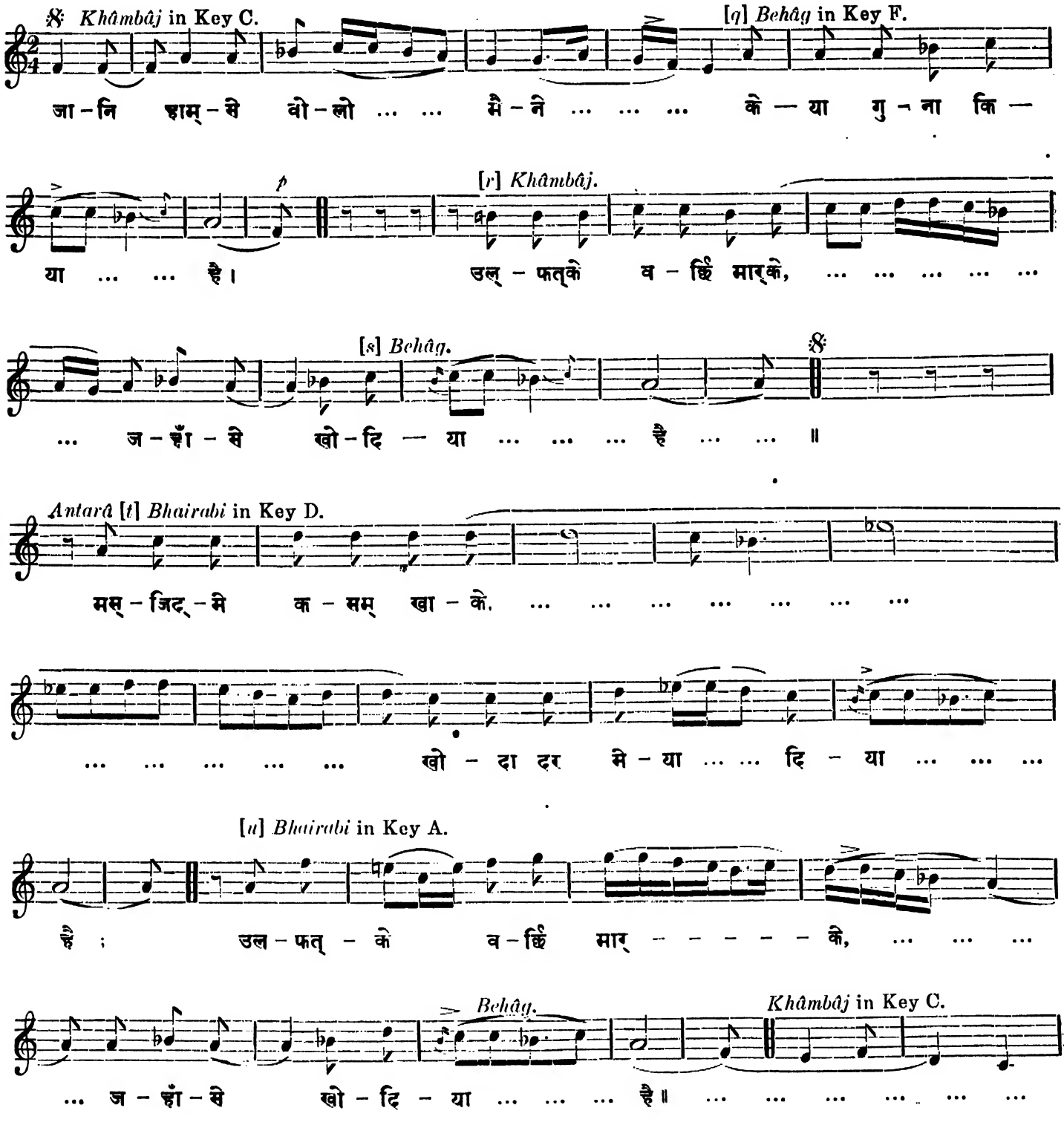
* *Tappâ* is a light form of *Ustâdi* (*i.e.* Indian *virtuoso*) music.

† *Thungri* (ठुंगरि), is a class of lighter sort of songs, which, though short, have much variety in their forms (such as change of *Râgas* within the song), that make them agreeable.

‡ *Antarâ* is like the second figure. In *antarâ* the music is developed through tones of the upper octave.

by this,.....in particular songs, change of *Râga* is seen to be produced. An example of this is given in the following well-known *Thungri* song (*Jâni hâmsay bôlô mainay keâ gunâ kiâ hôi*), in Urdu (language).



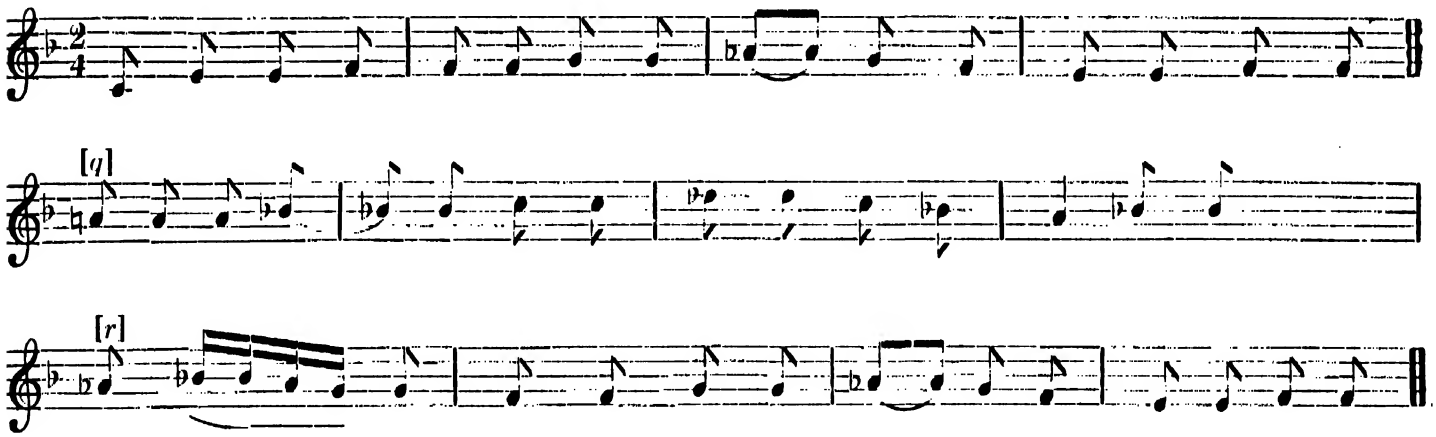
"There has been a combination of three *Râgas—Khâmbâj*, *Behâg** and *Bhairabi*, in this song. Beginning at first in *Khâmbâj* in key C, at the place marked [*q*] it has been reduced to *Behâg*, as the *dha*'s ('*a*'s of key C) have taken the form of *gâ* (Mi) of *Behâg* here. Therefore this *Behâg*, commencing in key F has ended in it; then at [*r*], through natural *ni* (*b* natural), passing to key C, *Khâmbâj* having re-appeared

* In the prevalent *Thât* of *Khâmbaj*, besides the other six tones both *ni* natural and *ni komal* (*b* and $b\flat$) are used. Prevalent *Thât* of *Behâg* is *c, e, f, f*♯, *g, b*.

has, at [*s*] again been reduced to *Behâg*. In the *Antarâ*, *Bhairabi*, manifesting itself, and at [*t*] making *dhâ* (*a*), its *pâ* (Sol), has, with *komal gâ* (♭) taken to key D. There, it will be seen, the *gâ* (♭) has become *komal ri* (flat Re) of *Bhairabi*. Then at [*u*], making *dhâ* (*a*), the *sa* (Do), and in ascension reducing higher *mâ* (upper *f*) to *komal dhâ* (flat La), and natural *gâ* (*e* natural) to *pâ* (Sol), (*Râga Bhairabi*) has ended in descension in key A. Lastly, with surprising skill, (the song), after (changing to) *Behâg*, has reunited with *Khâmbâj* and terminated in it. In this way assuming new shapes, the song has gained a good deal of variety. Hindustani *Tappâ* (song) singers, as a rule, always sing songs with similiar tunes. The (music of the) song, as given above, is one of the various ways in which it is sung. .....

"In *Thungri* songs of Lucknow type, the above form of modulation, and change to different *Râgas* usually take place. *Kâlâbats* (Indian *virtuosos*), out of jealousy, can not tolerate this" (type of song, as, though more easily learnt, *Thungris* are more liked and are more agreeable to the public, than some songs, of these *Kâlâbats*, in spite of the fact that the latter required laborious efforts to learn them. These *Kâlâbats* object to the *Thungri* songs as grammatically incorrect, *i.e.* defective in the grammar of Indian *virtuoso* music as understood by them). (*vide* Vol I, Ch. 10).

"*Râgini Pilu*. (of prevalent *Thât c, d, ♭, f, g, ♭, b*, written below in key F) through natural *gâ* (*e* natural), modulates to key F, *e.g.*:—



At [*q*], through natural *gâ* (natural Mi of key F *i.e. a* natural), it has passed to key F; thence *Pilu* has commenced as if, anew, as, the *komal dhâ* (♭), which is the *komal gâ* (Mi flat) of key F, has appeared before. On this account, *Pilu* has a great tendency to modulate to key F. Afterwards, (*Pilu*), again through *komal gâ* (Mi flat of key F *i.e.* ♭), returns to key C, as it has done at [*r*]. *Râga Bârôâ*, also modulates to key F, through natural *gâ* (*e* natural). .....

"Modulation, is the best of all methods for producing variety in music. Through this, by change of themes, newer and newer feelings and expressions are evolved. ..... Modern Hindustani and Bengali musicians are not cognisant of anything about the process of transition, as their dealings with (and consideration of) music, are entirely *cirâ race*;—thus they do not notice what takes place within (the music). Verily, to comprehend the true spirit of transition, abundant deliberation about (*i.e.* proper comprehension of) tones is necessary. Modulation, however, is always going on, unrecognised, within songs. It forms the principal limb (*i.e.* part) of music in a developed state. In our country, with the growth of dramatic music, the method of transition also, will be cleared up and advanced".

BERHAMPORE, (BENGAL.)

1925.

HIMANSU SEKHER BANERJI,

Translator.

Natural and Tempered Scales.

I have already said that the Gita Sutra Sar deals with natural scales. The difference between natural and tempered scales is well known to those acquainted with acoustics. The theory of these scales have been dealt with in Vol. I of Gita Sutra Sar. As Vol. I, however, is in Bengali, which language, the people of Provinces outside Bengal, are not familiar with, I think it will not be out of place to deal with the subject here. This chapter is meant for those, including English educated Indians, who take to Indian Music, with the accompaniment of the harmonium. In India, especially in Bengal, not to speak of ordinary singers, with whom the (tempered) harmonium is an indispensible accompaniment, even reputed artists, who, while singing, play on the *tâmburâ* for accompaniment, and who boast of the existence of minute intervals (minuter than semitones which they call *srutis*, see p. 21), are often seen to have their songs accompanied by the (tempered) harmonium, along with the *tâmburâ*. These Musicians do not understand what injury is done to Indian Music through the accompaniment of the harmonium, and how jarring and discordant, the simultaneous notes of the harmonium and the *tâmburâ* appear to "those whose art has not been contaminated by the tempered harmonium." For these Indian Musicians this chapter is especially intended. In dealing with the theory I have freely used mathematical ratios, as the subject would be more easily understood by educated Indians through figures, than by mere verbal descriptions. Those who are already familiar with this theory of acoustics need not go through this chapter.

In order to understand the tempered scales, we should first of all go a little into the theory of musical sound. Now, sound, including musical sound, is propagated to the ear by the vibration of an elastic substance, such as the air. For musical sounds, this vibration of the air may be produced in the air itself, as the column of air within a flute, or by the vibration of an elastic body, such as the wire of a stringed musical instrument, like the guitar, or the Indian *Tâmburâ*, *Sitâr*, *Esrâj*, &c. Take the case of a stringed instrument. If a stretched string of such an instrument, be left free to vibrate from two points, such as from the bridge and nut, and be tuned to *sâ* (Do), an octave higher *sâ*, can be played from half its length* while the number of vibrations per second, at half the length of the string, will be double that at the whole length of the string. This number of vibrations (per second). is called vibration frequency, which, it will be seen, is inversely proportional to the lengths of the string (for purpose of pitches). The ratio of these vibration frequencies is called the musical interval. Thus, the interval between *sâ* and its octave higher *sâ*, is as 1 is to 2. While dealing with natural scales, it has already been said (see p. 6) that there are three sorts of intervals, major (as between *sâ* and *ri*), minor (as between *ri* and *gâ*), and semitone (as between *gâ* and *mâ*), and that their ratios are $\frac{9}{8}$, $\frac{10}{9}$ and $\frac{16}{15}$, respectively. Thus, if *sâ* (Do) be played at length CX, an octave higher *sâ* will be played at half its length, CX, and *ri* (Re) will be played at $\frac{8}{9}$ths its length, DX, (see fig. 1). While the ratios of their vibration frequencies, (*i.e.* intervals) will be as 1, $\frac{8}{9}$ and $\frac{9}{8}$, respectively. Similiarly (see fig. 2) if the string be retuned, and the whole length of the string be made to play *ri* (Re), then *gâ* (Mi) will be played at E, EX, being $\frac{9}{10}$ths of CX. Now, if the *sâ*, played on CX in fig. 1, be called *c* then the *ri* played on both DX in fig. 1, and CX in fig. 2, will be *d*. If you take this *d* as a new key-tone *i.e.* as *sâ* (Do) then the second tone of this scale *i.e.* *ri* (Re), will be played at $\frac{8}{9}$ths CX of fig. 2 *i.e.* by the length E^1X. Thus, the second tone *ri* (Re) of Key D (played on E^1X), is not the same as the third tone *gâ* (Mi) of key C (played on EX). Now the third tone *gâ* (Mi) of key C is *e*. This *e* is therefore not exactly the same as the second tone of

Fig. 1.

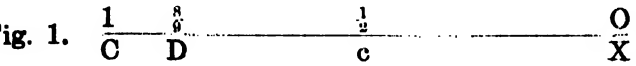


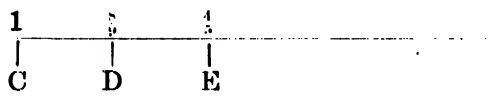
Fig. 2.

* In all such ratios for tones, it should be understood, that, in order to conform with these theoritical proportionate lengths and ratios, the string should be of uniform thickness and density throughout its length, and that the tension on the string, should be kept constant, while sounding the tones, and not increased, or decreased by stretching it sideways, perpendicularly, or by putting different pressures while stooping for purpose of different tones.

key D. This is what is meant when we say that the tones of the (just) natural scale are not *absolutely* fixed in pitch in different keys. In pianoforte, harmonium &c. instruments, however, *e* as the third tone of key c is (taken) the same as, the second tone of key D, which is also called *e*. Thus *e* in these instruments is *absolutely* fixed in pitch. This is done by changing the natural values of pitches of *c*, *d*, *e* &c. to some artificilly fixed pitches. This will be dealt with later on.

INTERVALS.—Take the string as fixed at X (see fig. 3). If *sâ* (Do) be played at C. *ri* (Re) will be played at D, DX being $\frac{8}{9}$ of CX. Similiarly *gâ* (Mi) will be played at $\frac{9}{10}$ length of DX say at E. This DX is, however, $\frac{8}{9}$ of CX. Thus EX is, $\frac{8}{9}$ EX$\times\frac{9}{10}$, *i.e.* $\frac{4}{5}$ CX. Thus if *sâ* (Do) be played at *n* length *ri* (Re) will be played $\frac{8}{9}$ *n* length and *gâ* (Mi) at $\frac{8}{9}\times\frac{9}{10}n$ or $\frac{4}{5}n$ length. Now, the difference in pitches between *sâ* and *ri*; *ri* and *gâ*; &c. are called **Intervals.** The intervals, it has already been said, are inversely proportional to the above lengths on strings. Thus, the interval between *sâ* and *ri* (Do and Re) is represented by the ratio $\frac{9}{8}$, and that between *ri* and *gâ* (Re and Mi) by the ratio $\frac{10}{9}$. The interval between *sâ* and *gâ* (Do and Mi), is, similiar to the above case of lengths on strings, $\frac{9}{8}\times\frac{10}{9}$ or $\frac{5}{4}$. Thus, in raising the pitch from *sâ* (Do) to *ri* (Re) and thence to *gâ* (Mi), which is popularly called adding the pitches, we have to multiply the interval of *sâ* to *ri* ($\frac{9}{8}$) to that of *ri* to *gâ* ($\frac{10}{9}$). Similiarly for getting the difference between pitches, we have to divide the ratios of intervals. Thus, the difference between a *major* interval (as that between *sâ* and *ri*) and a *minor* iaterval (as that between *ri* and *gâ*), is $\frac{9}{8}$ divided by $\frac{10}{9}$ or $\frac{81}{80}$. This is called a *comma*. The intervals between *gâ* (Mi) and *mâ* (Fa), and that between *ni* (Si) and *sâ* (Do^1) is a *semitone* interval, represented by the ratio $\frac{16}{15}$. In the (just) natural scale, the intervals, as already said (see p. 6) are:—

Fig. 3.

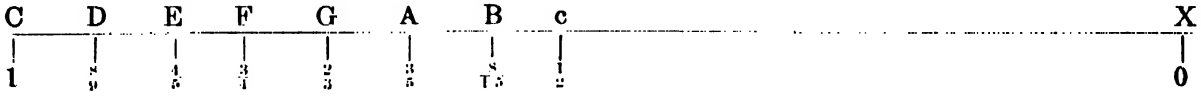


1st. (*i.e.* tonic)		2nd.		3rd.		4th.		5th.		6th.		7th.		8th.
	major		minor		semi-		major		minor		major		semi-	
sâ	$\frac{9}{8}$	*ri*	$\frac{10}{9}$	*gâ*	tone	*mâ*	$\frac{9}{8}$	*pâ*	$\frac{10}{9}$	*dhâ*	$\frac{9}{8}$	*ni*	tone	*sâ*
Do		Re		Mi	$\frac{16}{15}$	Fa		Sol		La		Si	$\frac{16}{15}$	Do^1

The logarithmic differences, which are accurately proportional to the intervals, are approximately as under, omitting superfluous Zeros. Do_{51} Re_{46} Mi_{28} Fa_{51} Sol_{46} La_{51} Si_{28} Do^1. These numerical figures, and the above ratios are taken from Deschanel's Physics. In the theory of dividing the octave into 53 degrees (of *Standard Course* by John Curwen, and of other books, see *ante* p. 21, foot-note) for the above differences, figures, a little less approximate, have been taken, viz:—Do_9 Re_8 Mi_5 Fa_9 Sol_8 La_3 Si_5 Do^1.

The proportionate lengths* on the string, in which these tones will be played are given below:—

Fig. 4.



These ratios for intervals between tones mentioned above, and the above relative lengths on the string, are fixed for all (just natural) scales in all keys, *i.e.* they are *relatively* fixed for all keys.

Tempered Gamut.—In keyed instruments, such as the pianoforte, harmonium &c.. each key, (white or black) must be (ready) tuned to some absolutely fixed pitch. Thus, in these keyed instruments, for purpose of modulation (*i.e.* change of keys) the pitches of some particular (white or black) keys can not be altered to suit the requirements of a particular modulation. This being the case, the difference between the *major* and the *minor* intervals can not be maintained, in these instruments. The following example will illustrate this. Let the (white) keys of an octave, of such an instrument, represent C, D, E, &c.:—

C, major, $\frac{9}{8}$, D, minor, $\frac{10}{9}$, E, F, G, A, B, c.

sâ (Do), major, $\frac{9}{8}$, *ri* (Re),

*The above proportionate lengths, if strictly adhered to, in the *Vinâ*, *Sitâr*, *Esrâj*, &c. will not produce the correct tones of the natural gamut, as, due to the graduated heights of the frets of these instruments, are required different tensions to be put on the string, while stopping on the different frets. (See *ante* p. 28 foot-note). These instruments are therefore tuned in practice, by musicians, by moving the frets, by judging the sounds on them by the ear, without paying much heed to the proportionate theoretical distances between the frets.

By maintaining the just natural intervals between C, D, E, &c., if we make D, the key-note *i.e sâ* (Do), E cannot be the *ri* (Re) of this key D. This will be apparent from the fact that the interval between D and E is a minor interval, while that between *sâ* and *ri* is a major one (see also fig. 2). Besides this key D, "a great variety of keys are employed in music, and it is a practical impossibility, at all events in the case of instruments like the piano and organ, which have only a definite set of notes, to maintain these ratios strictly for the whole range of possible key-notes. Compromise of some kind becomes necessary, and different systems of compromise are called different *temperaments* or different *modes of temperament.* The temperament which is most in favour in the present day is the simplest possible, and is called *equal temperament,* because it favours no key above [*i.e.* in preference to] another, but makes the tempered gamut exactly the same for all. It ignores the difference between major and minor tones [intervals], and makes the limma [semitone] exactly half of either. The interval between Do to Do^{1} is thus divided into 5 tones [whole-tone intervals] and 2 semitones"* [half-tones], as follows :—

Do 1 Re 1 Mi $\frac{1}{2}$ Fa 1 Sol 1 La 1 Si $\frac{1}{2}$ Do^{1}.

These whole-tone intervals (as bet. Do to Re; Re to Mi; La to Si &c.) are subdivided into half the amount, and at these (exactly) half intervals, (black) keys are placed. The intervals between Do to Do^{1} is thus divided into 12 equal half-tones, by which device, any key of the instrument (white or black) may be adapted for a key-tone. These half-tones, are, for these instruments, also called semitones. In the (just) natural scale, however, a semitone is not exactly half that of a major or minor interval. This will be apparent from the fact that—for two semitones, (we have to multiply the ratios for intervals, see p. 29), we have the ratio $\frac{16}{15}\times\frac{16}{15}$ or $\frac{256}{225}$, and this is a little greater than a major interval, of ratio $\frac{9}{8}$, and necessarily, also greater than the minor interval of ratio $\frac{10}{9}$. For finding out the value of the semitone (half-tone) of the equal temperament, we have to consider that the octave (Do to Do^{1}) is divided into 12 semitones, (of 5 whole-tones and 2 half-tones). If we take the ratio for this half-tone interval to be n, then the ratio of interval between Do to Do^{1} (12 half-tones making an octave), is $n\times n\times n\times$...... multiplied 12 times, or n to the power 12. But the ratio of the intervals from Do to Do^{1} (the octave) is, as 1 is to 2. Therefore, n to the power 12 is equal to 2. Thus, n *i.e.* a half-tone (semitone of equal temperament), has for its ratio, the 12th root of 2. A whole-tone being exactly twice this half-tone, has in this way the ratio of the 6th root of 2.

"The difference between the natural and the tempered gamut for the key of C is shown by the following table, which gives the number of complete vibrations per second for each note of the middle octave of an ordinary piano :—

		Tempered Gamut.	Natural Gamut.			Tempered Gamut.	Natural Gamut.
C	...	258·7	258·7	G	...	387·6	388·0
D	...	290·3	291·0	A	...	435·0	431·1
E	...	325·9	323·4	B	...	488·2	485·0
F	...	345·3	344·9	C	...	517·3	517·3

"The absolute pitch here adopted is that of the Paris conservatoire............ The stuttgard congress (1834) recommended 528 vibrations per second for C, and the C tuning-forks sold under the sanction of the Society of Arts are guaranteed to have this pitch............ What is generally called *concert-pitch* gives C about 538. The C of the Italian Opera is 546." (Deschanel's Physics *ibid.*).

There is no standard of pitch for India.—This has already been said (see p. 3 foot-note). Each musician, while singing or playing, fixes, during each performance, the pitch of a middle C (as his *sâ* or Do), by guess, according to his own taste and judgment.

Harmoniums, generally not in tune.—Like the pianoforte, organ &c., the harmonium, having the same sort of key board, is supposed, theoretically, to be tuned in the above equal temperament.

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* Deschanell's *Natural Philosophy* (Physics) translated by Everett, Subject, *Sound*; article *Tempered Gamut.*

It, however, being a reed insrument, worked by bellows, generally soon gets out of tune. This is especially the case with the country-made harmoniums that have become ubiquitious in India. This can easily be determined from the following tests:—Take two harmoniums, which have been in use for some time, and also in which the pitch of a key in one, agrees with that of a key of the other. After playing those keys of the two harmoniums, if the consecutive keys of both the instrnments be simultaneously played, it will generally be found that some of the notes,* from the latter keys, will not be in unision (in pitch) in the two instruments. Thus, the harmonium has not only an artificial gamut, (which departs from the natural gamut), but it also is genarally out of tune from even its theoretical (artificial) equal temperament to which it is assumed to be tuned to. Besides the above defect, a single harmonium is often out of tune within itself. This is generally found to be the case in instruments (especially those, made in India) having two or three sets of reeds. Such instruments are supplied with stops, which are generally entitled with names, such as:—Flute, Clarionet, Vox Angelica, Tremolo &c. Of these stops, some open the air aperture for, (and thus allow the play of), one set of reeds only. There are also stops which allow play of two, or three sets of reeds. These two (or three) sets of reeds are tuned, in some instruments, an octave apart, in some, though tuned in the same octave, their characters (similiar to the difference between the sounds of a gut string and a steel string, both tuned to the same pitch) *i.e.* timbres are different. There are also instruments with three sets of reeds, which are tuned either octaves apart, or in them the above methods of tunings are combined. The following practical tests with a harmonium, with two or more sets of reeds, which has been used for some time, will generally show, that some reeds (corresponding to a single key) of the different sets, are out of tune amongst themselves, thereby departing from the theoretical methods of tuning mentioned above:—Take such an instrument, and open the stop (or stops) which opens and gives play to all the sets of reeds. Now play consecutively all the (white and black) keys. It will be found that some keys will produce harsh and jarring sounds. Select such a key, and play it by opening a stop which gives play to one set of reeds only, and closing the stop (or stops) meant for all the sets of reeds. Next close that stop, and open another stop, which gives play to another set of reed. In this way, by playing the selected key of the instrument, through one reed only (of a set), the harsh or jarring sound will not be percieved, but that key played by opening (by the stop or stops) all the sets of reeds, will immediately produce the harsh and jarring sounds. This is due to the fact that the corresponding two or three reeds (from different sets) for that particular key of the instrument, are not in unision in pitch. either in octaves apart, or in the same pitch, which they were intended for. They are slightly different from their theoretical values. This causes the unpleasant harsh and jarring sounds as mentioned above, (due to the formation of frequent beats, as mentioned in the science of acoustics). Accompaniment with the harmonium, thus generally injures the sweetness of the voice, (the reason for this will be explained presently) and the ear of the singer. In the pianoforte there are devices for tightening or loosening its strings, whereby the instrument may be re-tuned, when it gets out of tune. The harmonium, however, can not so easily be re-tuned. To do so, it must have to be sent to the instrument-maker where an elaborate process of scraping the reeds, or changing them, must be gone into, for this purpose. It is probably due to this reason, that the pianoforte has been preferred to the harmonium, in Europe, and the latter has not there come in vogue, although it was invented in France.

Harmonium and Tambura injuring voice of singers.—I shall speak of the *Tâmburâ* first. Due to the rude stage of instrument-making existing in India, construction of stringed instruments has been left in the hands of ordinary carpenters. There is no proper selection and seasoning of wood, and the bridges of stringed instruments are generally made of bone or of some hard wood. The sounds of these instruments are necessarily very low. The author has shown (in Vol. I):—that in order to enhance the sounds of the *Tâmburâ*, by which an Indian *Ustâd* (*virtuoso*) accompanies his songs, and to make these sounds perceptible to his ears, pieces of cotton threads (*Jôâri*) are inserted inside the strings at their points of contact with the broad and sloping bridge (*Soâri*), made of bone or of some hard wood.—that this method, though making the sounds of the strings a little louder, produces a jarring sound.—that the human organ of sound is a very delicate instrument, and the voice unconsciously imitates the sounds heard by the ear.

* In these key-board instruments, the tones being not only relatively, but absolutely fixed in pitch, by "notes" of these instruments, are included what has previously been termed "tones" (see p. 3).

—that the voices of the students, at the time of singing, thus are often found to resemble the voice of their teacher.—that by constant accompaniment with the jarring sounds of the *Tâmburâ* Indian *Ustâd* singers in this way generally attain a harsh, uupleasant and jarring voice. This being the case with *Ustâd* singers, it may be judged what great source of injury, to the voice of ordinary singers and students, the harmonium is, with all its grave defects of tone and sound, as mentioned above. It is often seen that boys and girls, learning to sing (which is generally done with the accompaniment of the harmonium), soon lose the natural sweetness of their voices, and in about six months, they imbibe harsh and jarring voices which unaccompanied, are very unpleasant to the ear. The harmonium then becomes indispensible to them, in order to mask their voices. For this purpose these singers prefer such harmoniums, the sounds of which are of pronounced harshness. All this is tolerated in India, as here very little heed is paid to the sweetness and good tone of the voice, but too much attention is directed to the particular tones and modes that are supposed to be necessary and the particular tones that must be discarded (according to the theory of the particular singer, amongst many conflicting theories) for singing a particular *Râg* (melody-type), and also to the rhythms and the cross-rhyths* introduced extempore by singers and accompanying drummers. **Often, the natural sweetness of the voices of pupils are destroyed by the defective Indian methods of teaching.** In spite of all this handicap in the training of the voice, it can be observed, that amongst professional Hindustani songstresses, who generally do not use the *Tâmburâ*, (and of them, those who have not yet adopted the harmonium, but have their songs accompanied by the *Sâringi*, which is the Indian fiddle), there are many, who have not totally lost, but do retain a part of the natural sweetness of their voices. From this it may be inferred what great injury to the voice is done by the harmonium. Though so injurious, yet the harmonium is, gradually being adopted by all classes of singers in India, whether *Ustâds* or pupils. It was not so wide-spread during the author's time. To those, whether conscious or unconscious of its defects, who use the harmonium and wish to cling to that imperfect importation from Europe, I wish to point out what an European himself thinks of the instrunment after personal observation in India.

Mr. Fox Strangways on the Harmonium :—

"If the rulers of native states realized what a death-blow they were dealing at their own art by supporting or even allowing a brass band, if the clerk in a Government office understood the indignity he was putting on a song by buying the gramophone which grinds it out to him after his day's labour, if the Mahomedan 'Star' singer knew that the harmonium with which he accompanies himself was ruining his chief asset, his musical ear, and if the girl who learns the pianoforte could see that all the progress she made was as sure a step towards her own denationalization as if she crossed the black water and never returned—they would pause before they laid their sacrilegious hands on Saraswati. Excuses may be made for such practices, but there is one objection fatal to them all; the instruments are borrowed. We do not hear much about Roman music because it was so easy for them to get Greek slaves; and the importation of the gavotte and the minuet killed the English Morris-dancer. To dismiss from India these foreign instruments would not be to check the natural, but to prune away an unnatural growth." *Music of Hindustan*, by A. H. Fox Strangways, Oxford University Press (1914) at Intro. p. 16. "Hence the serious menace to Indian music of the harmonium, which has penetrated already to the remotest parts of India." (Here the writer adds in a foot note—"I was present for an hour at a concert in Trivandrum at which this appalling instrument never ceased, and I found in the Salt Range (Northern Panjab) a 'Teacher of song and harmonium.'") "It dominates the theatre and desolates the hearth; and before long it will, if it does not already, desecrate the temple. Besides its deadening effect on a living art, it falsifies it by being out of tune with itself.† This is a grave defect, though its gravity can be exaggerated; it could also be lessened by a revised tuning. A worse fault is that it is a borrowed instrument, constructed originally to minister to the less noble kind of music of other lands. It has taken a century to invent and perfect the pianoforte; if she must have the fatal facility of a keyed instrument, India could well spare a century or two for inventing something that should do justice to her music." *Ibid* Ch. VI. pp, 163-164.

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* For practical examples, and some detailed description of cross-rhythms, see *Music of Hindostan* by Fox Strangways.

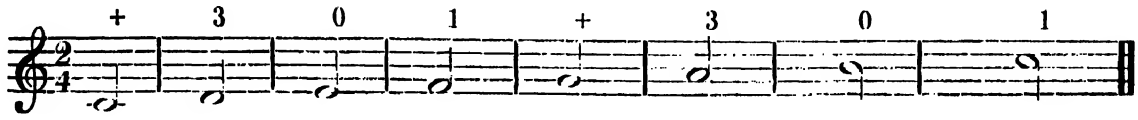
† This has already been explained, see above.

LAYA (লয়). *Tempo.*

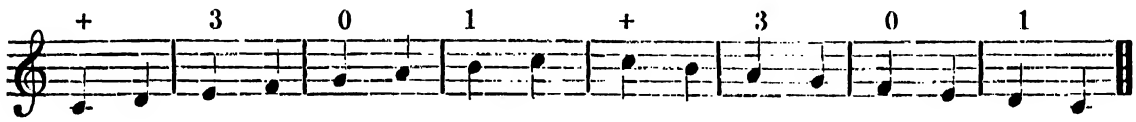
Laya, in its broad sense means 'time', of music, *i.e.* the keeping up of regular time, in music. In its special sense, the word signifies the pace at which a piece is performed. There are three primary degrees of speed *i.e.* "rates of movement" in Indian Music :—*vilambit* (বিলম্বিত্), or slow, *madhya* (মধ্য), or moderate, and *druta* (দ্রুত) or quick. The author of the Gita Sutra Sar, in order to properly depict the time, has introduced, in his practical examples of music, several gradations of these three primary divisions. The European equivalents, of the Bengali names used by the author, for these several degrees of speed, or pace, will be given in the musics, as *largo*, *andante*, *adagio*, *allegro* &c. in their respective places. Similiar to the European system, there is no fixed absolute measure of time, for the different degrees of speed, mentioned above. There is also no fixed proportion between slow, and fast or moderate times. There is an exception to this general rule, for some *degrees of movement*, when required to be performed *in the same piece of music*. This is exemplified below :—

Vilambit (slow) *Laya.* বিলম্বিত্ লয়।

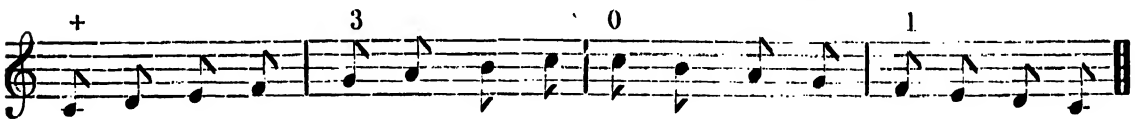
M. M. ♩=80.



Madhya (moderate) *Laya.* মধ্য লয়।



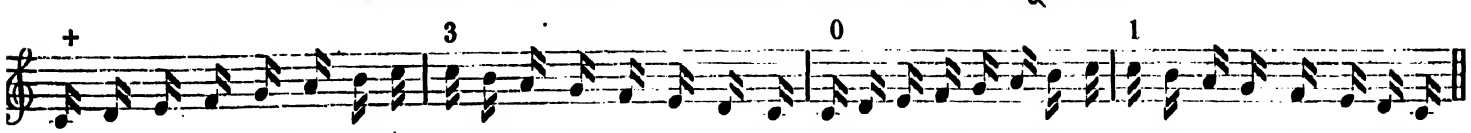
Doon (*i.e.* twofold or double quick) *Laya.* দুগুণা লয়।



In the *madhya laya*, the speed of each bar, remains the same, as in the above *vilambit laya* but two time-units (either in semibreves, or in crotchets, or quavers &c.) of the latter are played in the time of one time-unit of the former. In actual playing, the time of *madhya laya* appears to be twice as fast as that of *vilambit laya*. The author has intentionally written his music, in the above manner, (*i. e.* two bars of *vilambit* are condensed to signify one bar of *madhya*), instead of simply writing in the ordinary form of *vilambit*, and for the faster time, giving indications of movements by such superscriptions as 'twice fast', 'double fast', &c. The reason for writing in this manner is, that in actual performance, the measures of the music are to accord with the accented beats of the accompanying Indian pulsatile instruments, such as the *Tablâ*, *Mridanga* &c. These accented beats are indicated in the above examples by the signs +, 3, 0, 1, &c., the meaning of which will be explained later on. Similiar to the relation of *madhya laya* with *vilambit laya*, *doon laya* signifies, that two bars of *madhya laya* are to be performed within the time of one bar of *doon laya*, and in writing this movement, as illustrated above, two bars of *madhya laya* are condensed into one bar of *doon laya*.

In this manner *chaudoon laya* is twice as fast as *doon laya*.

Chaudoon (*i. e.* fourfold or quadruple quick) *laya.* চৌদুনা লয়।



The time value of ♩=80, (*i.e.* a crotchet is in the time of a beat of the metronome with its weight placed at mark 80), as given above, is not, (as is also the case in the European system), any absolutely fixed measure of movement, for all *vilambit* (and other) *layas*, but it only gives a general indication of time.

RHYTHM

OF INDIAN MUSIC.

Laya, it has already been said, means the keeping of regular time. Every sound must continue for a definite or indefinate length of time, and the continuation of a certain order in the division of time produces what is termed **Chhanda (छन्द)** or **Rhythm.** An arrangement based upon some specific idea or law, determining and regulating the rhythmical forms, and also the accented parts and places of slight rests (of the tongue, while singing), is termed **Tal (ताल).** *Tâl* originated from the metre* of Sanskrit poetry. Besides having this general sense, the word *Tâl*, is used in a specific sense, as when *sam*, *tâl*, and *phânk*, are spoken of. This will be dealt with later on. "There are two sorts of *Chhandas* in (Sanskrit) poetry—*Varnavritta* (syllable-fixed) and *Mâtrâvritta* (time-unit-fixed†). *Chhanda* of music may also be of these two sorts, but as *varnavritta chhanda* in music is very monotonous, it is not ordinarily used in music. *Mâtrâvritta Chhanda* only, is very suitable for purpose of music. Hence all *Tâls* are *Mâtrâvritta*" Gita Sutra Sar Vol. I. ch, 14 p. 155.

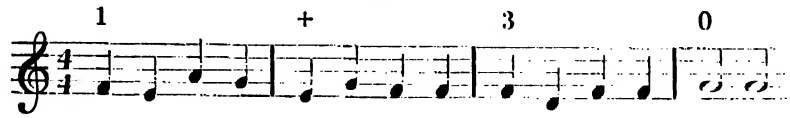
MATRA (मात्रा) *Laya*, it has been said, is keeping of regular time. "This regularity in time can be maintained in innumerable ways, and for this reason *Chhandas* are also innumerable. For measuring the time of a *Laya*, a unit of time is taken, for subdividing the *Laya* time, into equal parts; also by grouping these units of time, into groups of different numbers of units, varieties of *Chhandas* are formed. This time-unit is called a *mâtrâ*." *Ibid* p. 147. *Mâtrâ* has been translated by Mr. Fox Strangways (in his *Music of Hindostan*) as 'instant', 'unit', 'time-unit', 'time-length' &c. In the Gita Sutra Sar, in the practical examples of music in staff-notation, either a crotchet, or a quaver has generally been taken as a *mâtrâ*. A *mâtrâ* may no doubt, have a higher or lower value *i.e.* a semibreve, minim, semiquaver, &c. may form a *mâtrâ*. From the time-signatures in the author's examples of music, the value of a *mâtrâ* may be recognised. Thus:—Time-signature $\frac{3}{4}$ indicates that the crotchet is a *matra*. Similiarly time-signature $\frac{3}{4}$ indicates also that the crotchet is a *matra*. In this way, $\frac{3}{8}$ indicates that the quaver is a *matra*, and $\frac{6}{8}$ also shows that the quaver is a *matra*. As is the case in the European system, there is no absolutely fixed time-values for these crotchets, quavers &c. A *matra*, in this way, has no absolutely fixed time-value. The author has, in some cases, indicated these time-values by metronome figures. These metronome figures also, give only a general idea of the time-values, and no absolute standards. The time-value of each *mâtrâ* depends on the exigencies of a song, or instrumental music, and the will, taste, and judgment of the singer or player.

Chhanda, Tal. It has already been said, that by groups formed of different numbers of *mâtrâs* (time-units), and by different arrangements of these groups, various *chhandas* are formed. Though these groups of *mâtrâ* units are the parts and parcels of *chhanda*, yet *chhandas* consist of something else also. In them there are successions of regularly occuring accents at longer or shorter intervals (of *mâtrâs*). Along with these accents there are, similar to poetical metres, places of slight rests in *chhandas* (of music) also. The *mâtrâvritta chhandas* **(मात्रावृत्त छन्द)** in music *i.e.* TALs are principally of three classes:—(1) *Chaturmâtrik Tâls* **(चतुर्मात्रिक ताल)** *i. e. Tâls* of four *mâtrâs* (which includes *dwimâtrik* **द्विमात्रिक** *Tâls i.e.* of two *mâtrâs*) *e. g. Kâoâli*, *Arâ*, *Thungri* &c.; (2) *Trimâtrik* **(त्रिमात्रिक)** *Tâls* (of three *mâtrâs*) *e. g. Ektâlâ*, *Khemtâ* &c.; (3) *Bishamapadi* **(विषम-पदी)** *Tâls*, formed by the combination of the above two classes. *Dwimâtrik* (of two *mâtrâs*) and *Ashtamâtrik* **(अष्टमात्रिक** *i. e.* of eight *mâtrâs*) *Tâls* are included in the *Chaturmâtrik* class, and *Shanmâtrik* **(षण्मात्रिक** *i. e.* of six *mâtrâs*) *Tâls* come within the *Trimâtrik* class. These will be detailed later on. I shall next deal with accents and rests.

* "A great difference prevails between the music of Europe and that of the oriental nations in respect of time, in which branch it resembles more the rhythm of the Greeks, and other ancient nations, than the measures peculiar to the modern music of Europe. To all those who are acquainted with the principles of ancient music it will be unnecessary to observe that this rhythm was no other than the poetical feet which formed the basis of their musical measure." *Treatise on the Music of Hindostan*, by Capt. Willard, *ch.*—'of time'.

† These english translations of the Sanskrit terms have been generally taken from *The Music of Hindostan* by A. H. Fox Strangways.

Accents and **Rests.** Let us take the example of the common *Tâl*, known as *Tetâlâ* (तेताला). This is also called *Tritâl* (त्रिताल) or *Tintâl* (तिन्ताल).

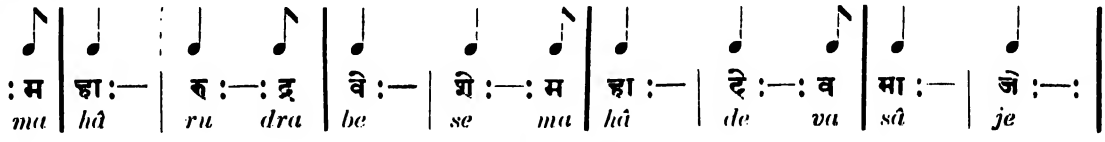


This *tâl* consists of 16 *mâtrâs*, divided into four groups (*padas* पद) of four *mâtrâs* each. Each *pada* is shown above, divided by bars. Like the European system, there is a slight rest at the end of each *pada* (here bar), and accent at the beginning of each *pada*. In *chhandas* of poetry the places where the tongue rests, or the breathing places, are called *Yati* (यति). Such rests for the tongue, in music, cannot be called *Yatis*. These rests, in music, are called *Nyâsa* (न्याम), what is termed **Cadence** in Europe. There were four varieties of *nyâsa** in the theory of ancient Indian Music,—*nyâsa*, *apanyâsa*, *samnyâsa*, *vinyâsa*, and the closing notes (or tone), at these *nyâsas*, were called *nyâsa-swara*, *apanyâsa-swara*, *samnyâsa-swara*, and *vinyâsa-swara* (न्याम-स्वर, अपन्याम-स्वर, संन्याम-स्वर, विन्यान-स्वर), respectively. In the prevalent *Tâls* of Indian Music, these varieties of *nyâsa*, are not recognised. It has already been said that each *pada* is a place of accent, and of a little rest. This accent and a little rest, are more prominent in a particular *pada*, than in the rest of the *padas* of the *Tâl*. This place of a little rest, and of heavy accent, is called **Sam.** This *sam* is the only *nyâsa* in modern Indian Music. Besides this *sam* there is no other **Breathing Place** or place of closing. Such being the case of places of rest, accent, is the principal element, for expressing *chhanda* of music, and therefore of *Tâl* also. With accent, the characteristic of a *chhanda* and its pace is very well manifested.

"Accents are the principal elements of *chhanda* (rhythm), and by accents the characteristic nature and *laya* of a *chhanda* are very well expressed. Sanskrit authorities on rhyme, however, have not used any specific name for accent. As, without some such thing, the form and *laya* of a *chhanda* can not be clearly shown, they have, for this purpose made rules for *Yati* (यति) or rest..... In going to show the form and *laya* of a *chhanda* with *Yati* alone, accent naturally appears as a matter of course. The relation of accent, with the (expression and) development of the form and *laya* of a *chhanda* is unavoidable and inseperable. Either in poetical metres, or in *Tals* of music, (in all of them), accent is of much importance." Gita Sutra Sar I, xiv, 161.

"In practical performances of vocal and instrumental music however, **accents** of *Tâls* are often **very little prominently shown.** It is for this reason, that in the vocal and instrumental music of India, there is the necessity of accompaniment by drumming instruments, such as the *tablâ*, *mridanga* &c., as without such drum accompaniment, the *chhanda* (rhythm) and *laya* (pace) of *Tâls* are not clearly manifested.

Accents are primarily of two kinds in *chhandas* of music—strong and weak. This is shown in the following example :—



In the above, the *varnas* (syllables) following the large and thick lines are in strong accent, and those after the short lines are in weak accent. Each of the portions, sub-divided by thin lines, between two large and

*I have already spoken (at p. 21, and foot note) of *graha* and *nyâsa swara* (there spelt as nyash and nyasha), as the initial and closing notes of a *Râga*. That is the popular idea. Strictly speaking, according to ancient theory, *graha*, *nyâsa*, &c. notes are parts and parcels of a *Gita*. *Gita* is difined as "रञ्जकः स्वरसंदर्भो गीतमित्यभिधीयते"। (*Sangita-Râtnakar* by *Sârangadeva*, with *Kallinâtha's* commentary, complete book in 7 chapters, Anandasram Press, Poona, 1896-97, at chapter IV, verse 1. Hereafter, references to this book will be given abbreviated as, S. R. IV, 1, and its commentary as comm.). S. R. thus defines Gita as a group, or galaxy of notes, (or tones, in melodic form), which is agreeable or entertaining. A particular music of a *Râga*, a song, or any other melody, may or may not begin or end in its *Gita*, *i.e.*, in the group or galaxy of notes, which, by their assemblage form its melody. As a decorated panel, or a piece of jewellery, may not begin or end in a complete pattern, but with some portions only of a pattern, or with some ornaments outside the groups of patterns forming the decoration, so a song, or a particular piece of music of a *Râga*, may begin or end with a few notes outside its *Gita*. The initial, and final notes (or tones) of a *Gita* are its *graha* and *nyasa swaras* respectively (S. R. I, vii, 30, 38). The closing notes of principal, and subordinate parts (*i. e.* sub-divisions) of a *Gita*, are its *Apanyâsa*, and *Samnyâsa*, or *Vinyâsa Swaras*.

thick lines, is called a *pada* or *gana*. Besides the above-mentioned distinction of strong and weak accents within a *pada*, there are differences in the accents of the *padas* themselves. For this purpose, *padas* are distinguished as *sam*, *tal*, and *Phânk*. This will be detailed later on. It will be seen that groups of *mâtras* form a *Pada* (पद or *Gana* (गण). Similarly groups of generally four *padas* form (the unit of) a *Tâl*. *i. e. Tâl* is formed by groups of generally four accented parts. For convenience of musicians and of recording of a *Tâl* in particular music, some *Tâls* are divided, in practice, into more or less than four *padas*. All *Tâls*, however, can be divided, according to the original rules of rhythm, into four *padas* of three *tâls* and one *phânk* (Gita Sutra Sar, I, xiv, 155).

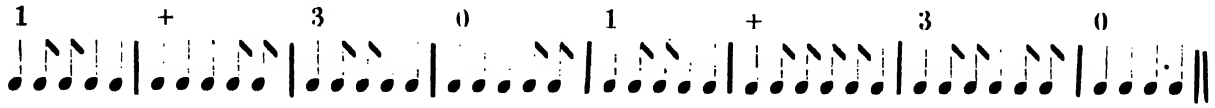
Avarta.—The groups of four (in some cases more, or less) *padas*, as mentioned above, by which the *chhanda* (rhythm) of a *Tâl* is expressed *i. e.* the groups of *padas*, forming one unit, or one complete round of its rhythm, is called a *Pher* (फेर) or an *Aordâ* (आवोर्द्दा). This is also called *âvartâ* (आवर्त्त). The words *âvarta* or *âordâ*, are corruptions from sanskrit *âvritti* (आवृत्ति). The rhythm of an *âvarta* is repeated, and goes round and round in a piece of music. This rhythm is, however, varied at places, by a good drummer, while accompanying a singer, and *vice versâ* by introduction of cross-rhythms. One *âvarta* of a *Tâl*, forms one *charan* (चरण or foot) of a poetical metre. *Padas* may be formed by groups of different numbers of *mâtrâs* (time-units). In this way different *chhandas* (rhythms), and a variety of *Tâls* are formed. An *âvarta* may begin from a *sam*, or from a *pada* which is not a *sam*, as shown below.

Sam, tal, phank (सम, ताल, फांक)—I have already said that accents of *Tâls* are very often not properly expressed by a singer or instrument player, who are generally solo performers, in India. Drum accompaniment, or clapping, and other motions of hands are therefore necessary for the purpose. For timing, and remembering the time of a *Tâl*, each modern *Tâl* is divided into *padas* (पद, or *vivhâgs*, विभाग *i. e.* subdivisions), of *sam*, *tâls*, and *phânks*, and for purpose of timing by hand-movements, both hands are energetically clapped at *sam*, clapped at a *tâl*, and at a *phânk* a sidewise motion of the hand is made, generally by beating the air with the right hand, and outstretching the fingers in the process. Hence this *pada* is called *phânk* or *khâli* (खाली). A *sam* is also a *tâl* (from *tâli* = clapping), the difference being, that the first sound of *sam* is a place of heavy accent, and the first sounds of both *tâl* and *phânk* are places of light accent. Besides these accents, the end of each *pada*, whether, *sam*, *tâl* or *phânk*, is a place of a little rest. Some European writers, and some Indian writers also, being misled by the name *phânk* or *khâli*, have distinguished *tâl*, and *phank*, as places of medium, and light accents, respectively. In practical music, however, there are no such distinctions. In the normal or *thekâ* (ठेका) form of drumming a *Tâl*, the proper accents of *sam* and *tâl* or *phânk* are prominently shown, but variations in rhythm and cross-rhythms of a *Tâl* are often introduced by a singer, or instrument player, and accompanying drummer (this will be detailed later on). In such cases, the accents of a *Tâl* are varied, but the two independent rhythms of both singer (or instrument player), and drummer, from time to time coincide at the *sam*. *Sam*, has thus this additional function, over and above, that of being a place of heavy accent, and of a little rest. Like that done by Mr. Fox Strangways, in his Music of Hindostan, I have written *Tâl*, where a particular rhythm is meant, and *tâl* for the particular *pada* of a *Tâl*. The sub-division of a *Tâl*, into *padas* of *sam*, *tâl*, and *phânk*, and the movements of the hands for each, has been introduced in India* in order to conveniently show and to remember the rhythm of a *Tâl*. Not only to remember the rhythm but also for convenience of the accompanying drumming instrument, the *âvarta* of a *Tâl* is divided into a *sam*, and so many *tâls* and *phânks*. Thus *Tâl Tetâla* (or *Tintal* or *Tritâl*), is said to consist of three *tâls* and

*The belly of the playing instrument, or the thigh of the performer is also sometimes struck with the hand, for timing *sam*, and *tâl*. The modern hand movements of clapping, and of beating the air, for timing a *Tâl*, and dividing into *padas* of *sam*, *tal*, *phânk*, most probably originated from similar ancient methods, with the initial *varnas* (syllables) of the names of various hand movements (S. R., V, 28). S. R. has given in mnemonic form, the hand-motions for timing several *mârga* (*i e.*, classical) *Tâls* (S. R. V, 28. *et seq.*), Four varieties each, with their names, of silent (निःशब्द) and sonorous (सशब्द) movements of the hand (क्रिया) are detailed in S. R. V, 4-9, and eight varieties of hand movements (करक्रिया, S. R. I. viii, 21-22 comm.) called *mâtrâs* with name of each, meant for measuring the *mâtrâs* (time-units S. R., V, 16), of ancient *mârga Tâls*, are described in S. R., V, 12-14. Some of these ancient hand movements are similiar to the modern movements of the hand, for timing *Tâls*.

one *phânk*. One of these *tâl*s is the *sam*. Loosely speaking each *pada* of a *Tâl* is called a *tâl*. Thus *Tâl Tetâlâ* is said to consist of four *tâl*s of four *mâtrâs* each; but when each *pada* is specially mentioned or shown by clapping, and beating the air, this *Tâl Tetâlâ* is said to consist of three *tâl*s and one *phânk*. Thus, though consisting of four *tâl*s (in the sense of *pada*s) this *Tâl* is called *Tetâlâ*, or *Tintâl* or *Tritâl* (lit. meaning—of three *tâl*s). When the different accents of a *Tâl* are specially mentioned or shown, a *Tal* is said to consist of one or more *sam*s and so many other *tâl*s and *phânk*s. Thus each *âvarta* of the following *Tâl Dhimâ Tetâlâ* (a form of *Tetâlâ*) is said to consist of a *sam* and two other *tâl*s and a *phânk*.

Tâl Dhimâ Tetâlaâ (ताल ढिमा तेताला).



In the above, the *sam* is on the second *pada* (also called on the second *tâl*), and is marked by the sign +, and the other *pada*s forming the two other *tâl*s are marked 1 and 3, and the *phânk* (or *khâli*) is marked by the sign 0. An *âvarta* of this *Tâl* is thus said to consist of 16 *mâtrâs* (time-units), and these 16 *mâtrâs* are said to be formed by 4 *pada*s (loosely speaking four *tâl*s) of 4 *mâtrâs* each. These *pada*s, it is said, are formed of three *tâl*s and one *phânk*, or more specially the *âvarta* is said to consist of a *sam*, two other *tâl*s and a *phânk*. In this *Tâl*, to indicate its rhythm, in the course of a performance, a musician will clap (or beat the thigh &c.) at the first sound of the 1st. *pada*, and call aloud* 1st *tâl*, and at the first sound of the second *pada* he will emphasize his clap (or beating of the thigh &c. with the hand), and call aloud *sam*. At the first sound of the third *pada* he will clap (or beat the thigh &c.) and call aloud third *tâl*, and at the first sound of the fourth *pada* he will beat the air, with his upturned palm, and call aloud *phânk*. Thus the *âvarta* of the *tâl*, in the above example, consisting of 1st *tâl*, *sam*, 3rd *tâl*, and *phânk*, is repeated and goes round and round.

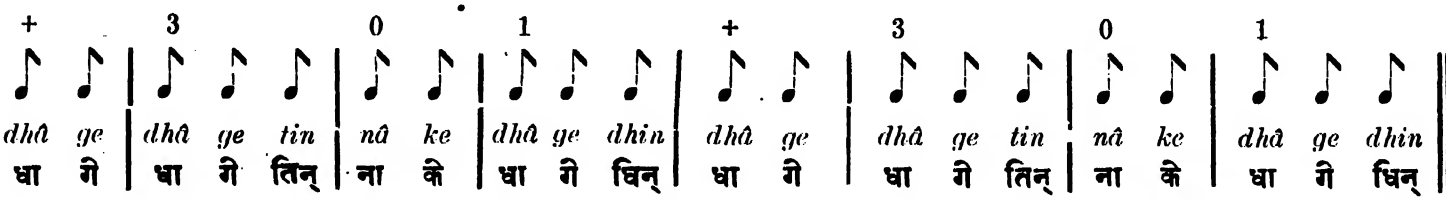
Meaning of +, 3, 0, 1, &c. In the above case, the *sam* is really the 2nd. *tâl*, but in order to conveniently indicate the place of *sam*, the sign + has been used instead of 2. The *phânk*, as already said, is shown by the sign 0. Thus, in the above example, the signs 1, +, 3, 0 have been used instead of 1, 2, 3, 0, in order to show the *sam*, *tâl*s, and *phânk*. The author has used throughout his books, the numerals, 1, 2, 3, 4 &c. for *tâl*s and 0 for *phânk*, and of the *tâl*s those which are the *sam*s, he has used for them the sign +, instead of a numeral number, such as +·instead of 2, in the above case.

Each PADA and not each AVARTA shown by the author as a bar. This method of subdivision of the *âvarta* of a *Tâl*, into *sam*s, *tâl*s, and *phânk*s, is not only required to show the rhythm, in actual performance, but it is a part and parcel of the Indian system of *Tâl*s and of drumming a *Tâl*. There are no seperate written drum musics for each song or for each class of songs, but oral drum musics *i.e. bol*s are set for a *Tâl*, and for this drum-music, a *Tâl* is divided into one or more *sam*s, and so many *tâl*s and *phânk*s. Thus it is convenient for an Indian singer and also a drummer, when each *sam*, *tâl*, and *phânk* is specifically shown in written music. It is for this reason, that the author, unlike some European, and some Indian compilers of Indian Music, has shown each *pada* (of an *âvarta*), whether a *sam*, a *tal*, or a *phânk*, as a bar, instead of the whole *âvarta* as a bar, as done by the latter. The author has also generally indicated in his music these places of *sam*, *tâl*, and *phânk*, by the signs +; 1, 2, 3 &c.; and 0. An *âvarta* is really the rhythmic unit, or measure of a *Tâl*. The author's system of showing each *pada* instead of each *âvarta* as a bar, may not be found difficult to follow, by an European in SAMA *Tâl*s, such as the above *Dhimâ Tetâla*, and also *Ektâlâ*, *Chautâl* &c., (see from practical examples of *Tâls post.*), in which the accents fall at equal intervals,

*In this there is a similiarity with that of ancient Greece. "If a comparison between the ancient music of Greece, which was principally borrowed from the Egyptians, and that of Hindoostan, might be hazarded, it would appear that great similiarity exists between the two. The same rhythmical measure, the same subdivision of semitones into minor subdivisions, the same noisy method of beating time, not only with the hand, but also with instruments of percussion; melody without harmony, in its present acceptation; and the similiarity of the effects said to have been produced by the music of the two nations. The Diatessaron or 4th of the Greeks was always fixed, while the intermediate sounds were mutable, which equally corresponds with the practice of Hindoostan." *Treatise on the Music of Hindoostan* by Capt. Willard. *Introduction.*

i.e. the *padas* (and thus the bars of the author) contain equal number of *mâtrâs*. This division of each *pada* as a bar may, however, at first sight, be found to be inconvenient by Europeans, in the case of VISHAMA *Tâls*, in which the accents fall at unequal intervals of time, as the following typical example of a *Vishama Tâl* will show (for other illustrations of *Vishama Tâls*, see examples of *Tâls post.*) :—

Tâl Jhâmptâl (ताल झाँपताल).



The unit of this *Tâl i.e.* an *âvarta* is of 10 *mâtrâs*, with alternate *padas* of 2 and 3 *mâtrâs* each. It may be asked, in the above case, that as the two *padas* of 5 *mâtrâs* are repeated, then why do not the two consecutive *padas* of 5 *mâtrâs* each, form an *âvarta* of the *Tâl*. The reason will be easily seen, if the accented parts be referred to. The first sound of the first *pada* is the *sam*, or the place of the heaviest accent, while the first sounds of the other three *padas* (shown as bars) are places of light accents. Thus, four *padas*, instead of two, form a complete unit, or *âvarta*, of the *Tâl*. These accents conform with the accented beats of the drum, and, as already said, though no drum-music is set for each song (or instrumental solo music), there are *bols* or drum-words for each *Tâl*. With the help of these *bols*, the rhythm of the *Tâl*, including its *sam*, *tâl*, and *phânk*, is remembered and practised. These *bols* will be further detailed later on. In the above example the *bol* of the *Tâl* has been given. In the above case, the *Tâl*, may at first sight seem to be in unequal time, but actually it is not so, for, in it, the equal-timed *âvartas* of ten *mâtrâs* are repeated and go round and round. This *âvarta* has been shown as a bar, as already mentioned, by some European authors *e.g.* Mr. Fox Strangways in his *Music of Hindostan*. Mr. Clements, in his *Introduction to Indian Music*, has suggested a bar for an *âvarta*, and (vertical) dotted lines for the *padas* of an *âvarta*. None of these authors have used the signs 1, +, 3, 0, &c., or any such signs for *sam*, *tâl* and *phânk*. If the *âvarta* be divided as a bar as done by the above European authors, the *Vishama Tâls*, will not look like ones in unequal time, and may be found more convenient to Europeans, than the present author's method of showing each *pada* as a bar. The division of each *âvarta*, into *padas* of *sam*, *tâl* and *phânk* is, however, as already said, a part and parcel of the *Tâls*, especially of the drumming of the *Tâls*. This is the case whether the normal or *thekâ* forms of a *Tâl* is drummed, or variations and cross-rhythms are introduced in drum accompaniment. In the course of these variations and cross-rhythms, the normal accents of a *Tâl*, are often varied by the drummer, but these drummer's varied accents, coincide from time to time, with the singer, at a *sam*. The drummer often passes over one, two, or more *âvartas* and even parts of *âvartas*, before his new rhythm thus agrees in accent at a *sam*. It will be seen that the author has placed the *sam*, at the first *pada* in some *Tâls* and at the second and other *padas* of other *Tâls*. This is unlike that done by some European and Indian authors, who have invariably placed the *sam* at the first sound of the *âvarta*, or, in cases where the *âvarta* is divided into *padas*, at the first (sound of 1st) *pada* of the *âvvata*. For reasons of his placing the *sam* in some cases at the first *pada*, in some cases at the second *pada*, and in other cases at other *padas* *i.e.* at the 1st sounds of these *padas*, the author says :—"To show whether the *thekâ*" (normal form of *Tâl*) "play of the drummer, accompanying a singer, is going on in the same *chhanda*" (rhythm) "as that of the latter, and whatever *bol*", (drum-words) "and *paran*" (variations including cross-rhythms) "the former may play, that these are progressing in the same *laya*" (in time and pace) "as that of the song, of all other places of the *Tâl*, it is only at these particularly mentioned" (first sounds of first, second, or other *padas*) "places that these are the most prominently shown. It is on account of this, that these parts have been named *sam*" (from *sama*, सम=similiar), Gita Sutra Sar I, xv, 200. Thus, unlike the compilations of Indian Music by some European and Indian authors, the *sam*, will be found to be placed by the present author at the first sound of other than the 1st *pada* in some cases, as it is based on the whole system of drumming, especially the system of

Why smallest group of MATRAS, not an AVARTA.

Cross-rhythms of drummer and singer coincide at SAM. Place of SAM at the first or other PADAS.

drumming, that the author found to be prevalent in Bengal. The *sam*, *i.e.* the heaviest accent, thus, not falling in all cases in the 1st sound of an *âvarta*, the depicting of the whole *âvarta* as a bar, would not conform with the above-mentioned system of drumming. Thus the division of each *pada* as a bar, as done by the author, is more convenient to an Indian Musician, than the showing of each *âvarta* as a bar. If the real nature of these *padas* be understood, *viz.* that groups of four (or more, or less) *padas* from equal measures of *âvartas*, the author's method would not be found difficult to follow, even by an European. From the practical examples of *Tâls* (see *post.*) it will be seen that the four bars (*padas*) beginning with the *sam* sign at the 1st sound at the 1st bar in *Tâl Ektâlâ*, the six bars beginning with the *sam* at the 1st sound at the 1st bar in *Tâl chautâl*, the four bars with *sam* at the second *pada*, in *Tâl Dhimâ Tetâlâ*, and the four bars with *sam* at the third bar (*i.e.* at the first sound of the third *pada*) in *Tâl Arkhemtâ*, each form an *âvarta*, or unit of that particular *Tâl*. Though practically speaking each *âvarta* is the unit (measure) of a *Tâl*, to suit the Indian system of *chhanda* (rhythm of *padas*), the author, as already said, has shown each *pada* of a *Tâl* instead of each *âvarta*, as a bar.

Time-signature.—It has already been explained (see p. 34) that the value of a *mâtrâ* in crotchets, or quavers, &c. may be found from the time-signatures of the author. In these time-signatures, a semibreve is taken as the unit, or 1, and the crotchet, quaver, &c. are taken as the fractions of this unit. Thus, a minim is taken as $\frac{1}{2}$, a crotchet as $\frac{1}{4}$, a quaver as $\frac{1}{8}$ &c. The lower figure in this way shows that the *mâtrâ* is either a minim, or a crotchet, or a quaver &c. The upper figure in the time-signature shows the number of *mâtrâs* in a *pada* (bar). Thus,—time-signatures $\frac{2}{4}$ and $\frac{2}{2}$ indicate that there are two *mâtrâs* in each *pada*. Similiarly, $\frac{3}{4}$, $\frac{3}{2}$, &c. indicate that there are three *mâtrâs* in each *pada*, $\frac{4}{4}$, $\frac{4}{2}$ &c. indicate four *mâtrâs* in each *pada*, and $\frac{5}{4}$, $\frac{5}{2}$ &c. indicate five *mâtrâs* in each *pada*. In this manner, the lower figure of the time-signatures—$\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$ &c. indicate that a crotchet is a *mâtrâ*, and $\frac{2}{8}$, $\frac{3}{8}$, $\frac{4}{8}$, $\frac{5}{8}$, $\frac{7}{8}$ &c. show that a quaver is a *mâtrâ*.

Time-signature in VISHAMA TALS.—The time-signatures of *Sama Tâls* will be easily understood from what has been said above. In *Vishama Tâls*, the *padas*, within an *âvarta* of a *Tâl* are of unequal length, and the author has shown the nature of each *pada*, by time-signatures for particular *padas*. Thus in a *Vishama Tâl* there are more than one time-signature. In such *Tâls* there may be two or three time-signatures. Thus, in *Tâl Jhâmptâl*, time-signatures $\frac{2}{4}$ and $\frac{3}{4}$ consecutively, show that there are alternately *padas* of two and three *mâtrâs* each, (and that in the particular example a quaver is a *mâtrâ*). Similiarly time-signatures $\frac{3}{8}$ and $\frac{4}{8}$, in *Tâl Jat* show that there are alternately *padas* of there and four *mâtrâs* each. In this manner time-signatures $\frac{2}{4}$ and $\frac{3}{4}$ in the practical illustration of *Tâl Arâ Chautâl* show, that each *âvarta* of this *Tâl* is formed by one *pada* of one *mâtrâ*, followed by three *padas* of two *mâtrâs* each. In this way time-signatures $\frac{3}{8}$, $\frac{3}{8}$, and $\frac{4}{8}$ in a *Tâl* will show that the *padas* preceded by time-signature $\frac{3}{8}$ are of three *mâtrâs*, those preceded by $\frac{2}{8}$ are of two *mâtrâs*, and those following time-signature $\frac{4}{8}$, are of four *mâtrâs* each. It will be seen that where the lower figure is 8 in the time-signatures, in those cases, as already explained, the quaver forms a *mâtrâ*, and the cases in which the lower figures is 4, the crotchet is a *mâtrâ*. The author has generally used the crotchet, or the quaver for a *mâtrâ*.

MATRA not absolutely fixed in value.—These crotchets, quavers &c. and the time-signatures, (and also the metronome figures), as given in the illustrations of *Tâls* should not be taken as the absolute standards for the *mâtrâs* of these *Tâls*. As already said, a *mâtrâ* may be formed by the doublings, halvings, &c. of these units. Thus—where in the practical illustration of a *Tâl*, a crotchet is shown as a *mâtrâ*, in some music in that *Tâl*, a minim, a quaver, or a semiquaver &c. may form a *mâtrâ*, while the number of *mâtrâs* in each *pada* remains the same. In these cases the lower figure in the time-signature will change, while the upper figure remains the same. As already said these **minims, crotchets, quavers, &c. have no absolute, but only relative time values.** Again, the general structure of the rhythm remaining the same, the *padas* of particular music in a *Tâl*, may be formed by *mâtrâs*, half or double, the number of those given in the practical illustration of that *Tâl*. Thus—*Tâls Kâoâli*, *Thungri*, *Kâhârbâ* &c. are varieties of *Tâl Tetâlâ*, which has four *mâtrâs* in each *pada* and has $\frac{4}{4}$ for its time-signature. These varieties of *Tetâlâ* may, however, be shown by two *mâtrâs* in each *pada*. We have already seen that the *dwimâtrik* (with *padas* of two *mâtrâs* each) are included within the

chaturmâtrik (with *padas* of four *mâtrâs* each) class.. Thus *Tâls Kâoâli, Thungri, Kâhârbâ* &c. may be shown with *padas* of two *mâtrâs* each, and with time-signature $\frac{2}{4}$, and they have been actually so illustrated by the author. Particular music in these *Tâls* may have 4 *mâtrâs* in each *pada*, and may have time-signature $\frac{4}{8}$ or $\frac{4}{4}$. Similiarly *Tâl madhyamân*, another variety of *Tetâlâ*, may have time-signature $\frac{4}{4}$ or $\frac{8}{8}$.

Metronome Figures.—The metronome figures given by the author show the value in terms of Maelzel's metronome. In that metronome, as is well known, when the pendulum is set free after placing the weight at mark 60, it gives 60 ticks (beats) per minute. Thus M. M. ♩=60 means that the time value of 60 crotchets is one minute. Similiarly M. M. ♪=116 means that 116 quavers take one minute, and if the weight of the metronome be placed at mark 116 and the pendulum be set free, the metronome will give 116 ticks per minute. Thus M. M. ♪=116 means, that each quaver is to take the time of each tick (beat) of the metronome when its weight is placed at mark 116. Similiarly M. M. ♪=208 indicates that the time value of a quaver is the same as that taken by each tick of the metronome, the weight of the metronome being placed at mark 208. These figures, as already said, are meant for only average speeds, and are not any absolute standards. The pace of the music is generally increased in the course of the performance. Thus, after taking a phonograph record of an actual performance, Mr. Fox Strangways (*Music of Hindostan* IX, 233—235) found the pace at first to be M. M. ♩=110. Then it increased to ♩=130; after some bars to ♩=150, thence to ♩=170. Afterwards it increased to ♩=220, ♩=230, and lastly it finished with ♩=260.

DRUMMING.

It has already been said that in Indian drumming the accents are often altered when variants of *Tâls* are introduced. Though this is well known in India, a music of this book when actually sung before an European audience, its *Tâl* may not be apparent to them if variants be introduced by the dummer in course of accompanying the song. I shall therefore briefly describe here the nature of this drumming. In India, as already said, drum music is not ready set for each particular vocal or instrumental piece of music, but lessons in drumming are imparted *viva voce* for each *Tâl*. A drummer practises in this way, not only a *Tâl* but also the drum-variants and cross rhythms for that *Tâl*. While accompanying a singer or instrument player, a drummer is not expected to be told beforehand, the *Tâl* of the song, or music. He has to learn drumming a *Tâl* independently of accompanying a song, or instrumental music. To improve his practice, he no doubt is sometimes allowed to follow a song, or music, performed for that purpose. There are no written drum music (गत् or खरलिपि) set for each particular song or instrumental music. A drummer in India is expected to accompany *extempore*, a singer or an instrument player, whom the drummer may not have seen before, or whose performance he may not have heard before, not to speak of previously practising his drum accompaniment with that singer or instrument player. In an actual performance, a drummer, thus at first hears the first few bars of the song or instrumental music, that he is going to accompany. He then fixes in his mind the *Tâl* of the music, and after thus recognising the *Tâl*, the drummer begins playing the normal form, or what is called the *Thekâ* of the *Tâl*, with which, the *Mâtrâs*, and all the accents of the *Tâl*, are prominently displayed. As the performance progresses, an able drummer introduces from time to time, *paran i.e.* drum-variants, including cross-rhythms, by which the accents of the *Tâl* are varied at places. There are no set written music in notation, for either the *Thekâ* of the *Tâls*, or their drum-variants, but there are *bols* or drum-words. I shall deal with them next.

Theka, Bol. Says the author,—"For testing and controlling, as to whether the *Laya*" (pace) "and *Chhanda*" (rhythm) "of a song or other music, are being correctly rendered, there exists from ancient times the usage, in Indian Music, of accompanying the *Chhanda* of the singer by playing that *Chhanda* with consecutive heavy and light strokes on the *Bnâyâ*,* *Mridanga*, &c. instruments. This is called playing **Theka** (ठेका). Names have been coined for each of these strokes, according to their accents and of their heavy and light natures, such as *dhâ* (धा), *tete* (तेटे), *dhin* (धिन्), *tâk* (ताक्), *tâ* (ता), *dit* (दित्), *thun* (थुन्), *nâ* (ना), &c. These are called the *bols* (बोल्) of the *thekâ* (ठेका)" These *bols* may be compared with the 'Time-names' exemplified in *the Standard Course*, by John Curwen. The author of the Gita Sutra Sar continues,—"There are seperate *bols* for each *Tâl*, by memorising which, if these *bols* be articulated" (*cf.* Taatai-ing Time-names *ibid.*) "with clapping of hands (*tâli*), and with beating *phânk* (beating the air with the upturned palm), in accordance with their accents, the *Chhanda* of a *Tâl* can well be learnt." Gita Sutra Sar I, xiv, 157, 158. **The examples of TALS in the author's book are the THEKA forms of these TALS.** The *bols* for these *thekâs* of the *Tâls* have been given in Vol. I of the author's book. Some *thekâ bols* have already been quoted therefrom. I shall also show by quoting from that volume, examples of other *thekâ bols*, and also a *paran*, (drum-variant), and the *bol* for that *paran*. The *bols* are mainly for *tablâ*, and *mridanga*, which only, are considered as high classes of drums in India. **The names of** the **TALS,** and **their structure, and** the **position of** their **SAM, Tal, PHANK, &c.,** as given in this book, **may differ from** those of **other authorities.** In exemplifying and naming the TALS, **the author has given what he** had actually **found** to exist **in the performances of reputed Indian Musicians, especially** the forms of the TALS **that** he had found prevalent **in Bengal.**

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*One of a pair of drums, both of which together are called *tablâ*. The one played by the left hand is called *bnâyâ* (बाँया), and that played with the right hand, is called *dâine* (डाइने) or *tablâ* (तबला). *Mridanga* (मृदङ्ग) is a barrel-shaped drum. These are played with strokes of fingers and hands, and generally all good classes of drums are so played. As exceptions to this general form of playing may be mentioned that of *dhâk*, *dhol*, *nâgarâ*, *charbare*, &c. which are played with sticks. Some *dhols* are played with hands. Besides this sort of play with fingers, hands and sticks, there are a few other forms of drums which are played otherwise, such as the *damaru*, an hour-glass shaped drum, which is played with two small balls attached to it by strings. Further description of these drums may be had from C. R. Day's *Music of Southern India*, London 1841. This book is out of print. A. H. Fox Strangeways *Music of Hindostan* also gives some description of Indian drums and their tuning.

PARAN. Besides the *thekâ* forms of the *Tâl*s, variations to these *thekâ* forms are introduced by a drummer from time to time. As already said a drummer, while going to accompany, at first carefully hears a few bars of the music sung or played, and in this way, after recognising the *Tâl*, he plays the *thekâ* of the *Tâl*, whereby the accents and *matrâ*s of the *Tâl* are prominently shown. It has already been said, that accents are not very prominent in songs. The *thekâ* play of the drummer gives prominence to these accents, and also to the (normal) rhythm of the *Tâl*. After playing this *thekâ* (or normal form) of the *Tâl*, for a little while, an able drummer is expected to introduce variations and cross-rhythms. While playing these variations, a drummer from time to time reverts to the *thekâ* form. An accomplished drummer is expected to continually introduce, at intervals of a few *âvârtâ*s, new variations, including cross-rhythms, to suit the rhythm of the singer or instrumental music player. While being accompanied by a drummer, the singer, and instrument player also, often introduces variations and cross-rhythms. Whatever variations a singer, or instrument-player, and the acompanying drummer may introduce, their rhythms from time to time coincide, as already said, at a *sam*. One, two, or more *âvarta*s (of the *thekâ* form of the *Tâl*) may pass before this meeting of both the rhythms at a *sam*.* This, as aleady said (see p. 36) is the significance of the word *sam* (from *sama* = similiar). These variations and cross-rhythms introduced by the drummer, and the play of these variations, including cross-rhythms, are called **PARAN** (परण). These *parans* are learnt by a drummer, similiar to the *thekâ*, independently of accompanying a song or instrumental music. There are practically no written musics for the drum, but similiar to the *thekâ*s, there are *bol*s for the *paran*s, and the latter are learnt and practised with the help of these *bol*s. These *bol*s for the *paran*s, are not set for any particular song or instrumental music, but are set for the various *paran*s of a *Tâl*. While accompanying, a drummer has to introduce, from time to time, the *paran*s of a *Tâl*, *extempore*. The singer or instrument player also, introduces variations and cross-rhythms, and also changes *laya* or pace. While accompanying such a singer (or player), an able and accomplished drummer is expected to introduce from time to time, (*extempore* no doubt), such change of *laya* and *paran*s, as would enrich the music by the juxtoposition of both the rhythms of the drummer and the singer. Besides thus improving, and enhancing the beauty of the music, these variations and cross-rhythms are sometimes introduced by the singer, or drummer, in order to show off this skill, or to establish one's reputation and superior skill, by the singer misleading, into a wrong time, or to false steps, the drummer, and *vice versâ*. Says Mr. Fox Strangways, after giving some examples of *paran*s, "..... a new rhythm in three time, which comes to an end just as the singer, going on in four time, reaches his *sam*....." (an exampie is given in the book). "This is a simple instance of a thing which is often enormously complex, which is very common, and which gives great pleasure to an Indian audience, who invariably greet it with appreciative *acchcha*'s ('good'). It is rare in our music, though iustances are to be found, as of most things, in Bach" (an example is quoted from the first movement of Bach's Violin Concerto in E major) "in which the violin breaking into three bars of $\frac{3}{4}$ arrives at the reprise of the theme simultaneously with the piano, which continues in common time.....

"But without inducing a climax, *parands* in a different rhythm are often introduced just for fun. The singer and drummer like to play hide and seek with each other; and the audience watch the contest with amusement." (The writer gives some examples from phonograph records taken by him from an actual performance).....

"These give but a slight idea of the intricacy which is sometimes attained by a really good drummer.....

"Drumming of this kind is in fact the substitute for counterpoint; it serves the same purpose as that does of carrying on the interest of the music over the 'dead' points, or of converging on a crisis. We are familiar with just such cross-rhythms in fugues....." (an example of such a Fugue is given in the book) *Music of Hindostan* by A. H. Fox Strangways IX, 230-238. The *parand* of this writer is the same as *paran* mentioned above.

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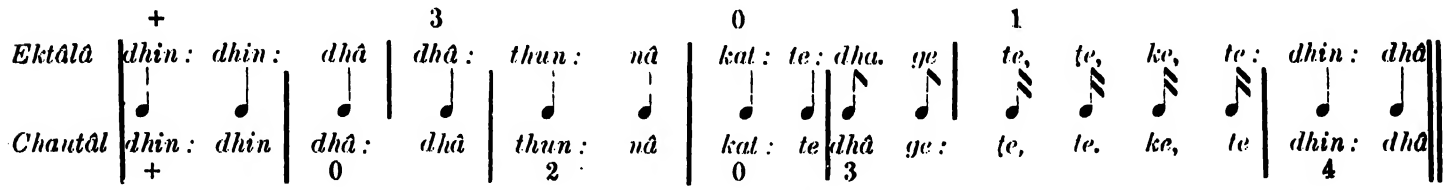
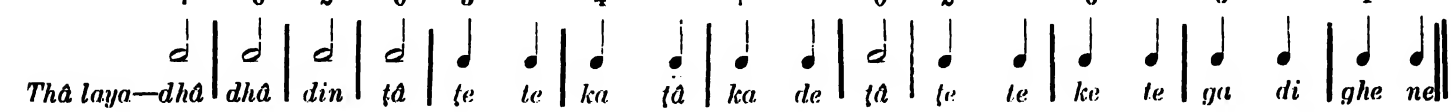
*"The *sam* has no such stress as we place on the first of the bar. It gets its pre-eminence over the other *tâl*s (beats) owing to the cross-rhythm (either with some other instrument or in the melody itself) being adjusted at that point. Or if there is no cross-rhythm, still the *sam* is pointed out by its distance from some typical or recurrent phrase elsewhere in the *âbard* (or *vibhâg*); as the quaver triplet of Tschaikowsky's Scherzo tells us how far we have got each time in the series of crochets. It is true that when singer and drummer coincide at that point their united triumph at having got it right after all does result in a little more tone, *i.e.* in stress, but this (is) in no way necessary to the rhythm of the music." *Music of Hindostan* by A. H. Fox Strangways VIII, 208, foot-note. What this writer calls *âvard* is the same as *âvarta*, and *vibhâg* is the same as what has been termed *pada*. The writer again says—"Indian drumming, then, varies the quality rather than the quantity of the tone. It practically ignores accent for its own sake. Such accent as there is on the first of the bar is due to the fact that two rhythms diverge from that point and converge at the beginning of the next or a later bar. It is the accent induced by the juxtaposition of opposing metres, as in the Rondo of Beethoven, Op. 22" (here the writer quotes a portion from the music of that Rondo) ".....that pleases the Indian; not the accent which is sought for its own sake as a means of contrast....." *ibid.* IX, 243. Mr. Fox Strangways has, in his book, taken the bar for an *âvarta*, and his bar (or *âvarta*) begins from the *sam*.

In the course of these *parans* the duple, quadruple, or triple time, with which a music is at first commenced may seem to vary in the course of the performance. For example, while accompanying a song in *Tâl Chautal,* the *thekâ* of which is in duple or quardruple timed *padas*, the drummer may introduce from time to time, triple time, resembling *Tâl Ektâla*. This will be found from the example given hereafter.

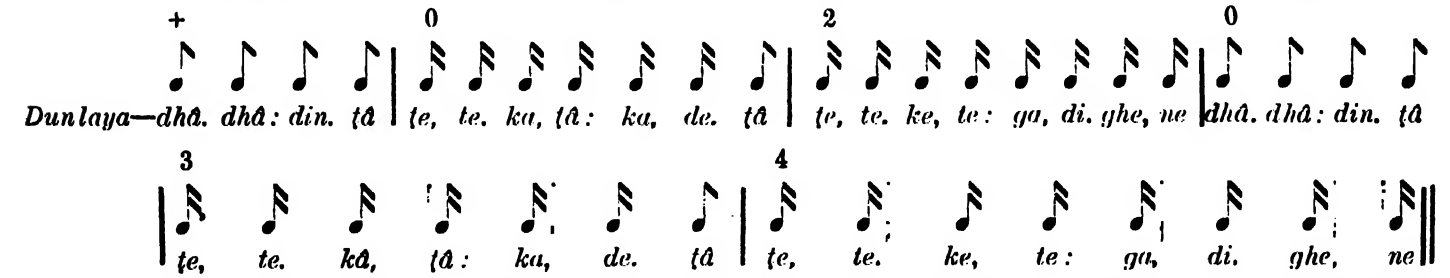
Change of Speed and LAYA. Besides the *parans* mentioned above, variations, in songs and in instrumental musics, are often introduced in India, as already said, by change of speed (pace). A song, or music, is commenced, generally in slow time, and in course of the performance the speed is increased. The speed may also seem to change, and it is actually changed, by change of *laya* (*tempo*) (see p. 33). For this purpose, in whatever *laya* a music may be played or sung, it has a normal time-unit. This unit is the *mâtrâ* of the *Tâl*. In the example given hereafter, of change of *laya*, the crotchet is the unit. A song is at first generally sung in *Thâ* (ठा) or *vilambit i.e.* slow *laya*, which is increased to *madhya or* moderate *laya*, which may again be increased to *dun* (*i.e.* two-fold) or even to *chaudun* (four-fold) or still faster *layas* (see p. 33). Besides these *layas*, *deri* (देड़ी) or one and a half times, and *ârhâi* (अढ़ाइ) or two and a half times (fast) *layas*, and similiar other *layas* may occassonally be found to be performed. These are often introduced by a singer to show off his skill, and he, who can introduce such fractions in *layas*, is considered to possess a superior ability. Such fractional and out of the way *layas* however, instead of enhancing, often mar the artistic effects of songs. Like *bols* for *parans*, there are *bols* for changes of *laya* also, as the example given below will show. Such change of *laya* is introduced by the singer, while the drummer plays the *thekâ*, and *vice versa*. Sometimes by this change of *laya*, and also through *parans* there is **convergence** of one *Tâl* either (1) in itself or (2) with some other *Tâl*. Thus, a bar of a *Tâl* is beaten with one hand by the drummer, while two bars of its *dun* are beaten with the other. Similiarly one *Tâl* may be 'converged' with another. This form of convergence, says the author, (at Vol. I, XV, 181), was probably the cause of *Tâl Chautâl* evolving out of *Tâl Ektâtlâ*. Thus redistributing *mâtrâs* of (triple timed) *Ektâlâ*, we get (duple timed) *Chautâl*:—



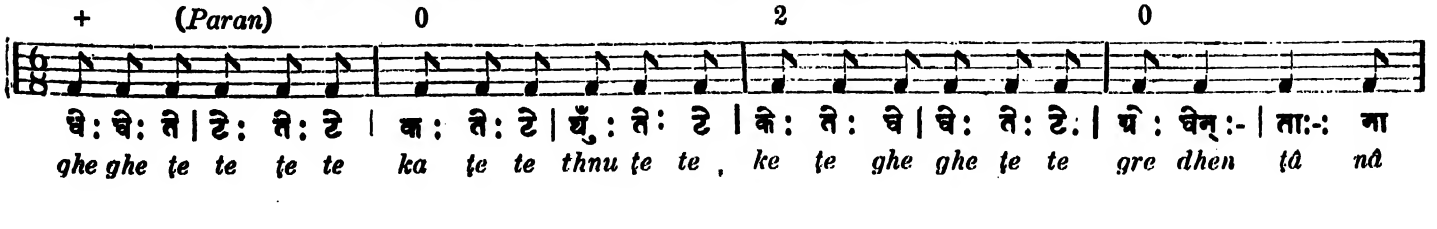
In the above, the *thekâ bols* of the *Tâls* have been given, and the above form of *chautâl* together with its *bol*, is in *madhya* (moderate) *laya*. This *Tâl*, in other *layas*, and their *bols*, are given below :—

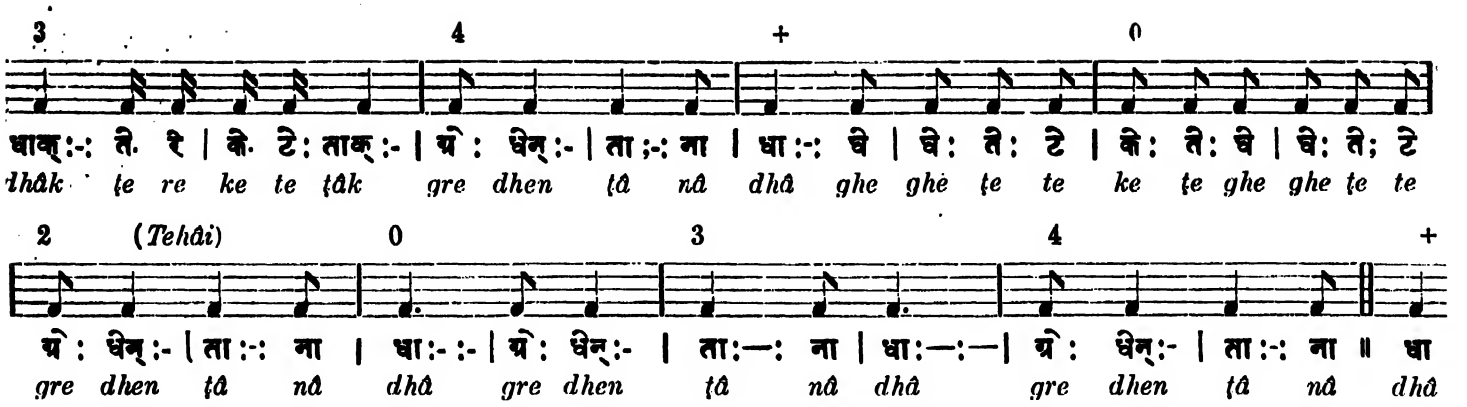


The two *âvartas* of each of the above, are condensed into one *âvarta* of *dun laya* as given below :—



Besides these variations in *laya*, as already said, variety is introduced by *paran*, and I quote an example of *paran* (the above) *Tâl chautâl*, from Vol. I (Ch. XV, p. 183) of author :—





This *Tâl Chautal* is used in *Dhrupad* (classical, and generally serious) class of songs. Real triple timed *chhanda* (rhythm) is not used in *Dhrupad* songs, but to produce variety, in *mridanga* playing, in *Tâl Chautal* (each *pada* of which is of two *mâtras*), each *mâtrâ* of it is now and then sub-divided into three parts as in the above example.

Tehai. In course of *paran* playing with drums, a sort of variation is introduced, which is known as *tehâi* (तेहाइ), as shown in the above example. In *tehâi*, three very heavily accented strokes fall at equal intervals of time, and the last of these heavy accents is on a *sam*. This *Tehâi* may or may not begin from the first sound of a *sam*, or the first sound of a *pada*. Thus it may begin from a portion of an *âvarta*. *Tehâi* may complete within an *âvarta*, or it may pass over one, two, or more *âvarta*s before coinciding in a *sam* in its third and last heavy accent. In Bengal, in the *bols*, these heavy accents of *tehâi*, are always termed *dhâ* (धा). In the above example, *tehâi* begins from where it is so written in the music, and it ends in the last *dhâ*. The last three *dhâ*s in the above example, are the places of the three heavy accents of the *tehâi*.

For other theories of *Tâl*s and of *paran*s, Vol I. of the author's book should be referred to. A good idea of some other *paran*s and of their *bol*s may be had from the illustrations of *paran*s given in Mr. Fox Strangways's *Music of Hindostan*. In Gita Sutra Sar, the *thekâ* forms of the *Tâl*s have been exemplified, and change of *laya* and *paran*, have been illustrated for some *tâl*s only.

Names of TALS and BOLS vary in India. Not only the *bol*s, but the names of *Tâl*s and even their structure vary amongst different authorities and also in different parts of India. The author has illustrated in his book, what *Tâl*s, as already said, he found to practically exist in India, especially in Bengal. As to the *bol*s, theorists and modern theoretical works, will speak of the meaning of each syllable of the *bol* as referring to a particular stroke, whether of the right, or left hand, or of the fingers, or of the heavy or light places of accent, or of the unaccented parts. Either the drummer or the theorist will rarely be able to prove all these theories by practical playing, and on close analysis these theories will be found to differ from actual practice. These things are taught and learnt by articulating the *bol*s verbally, and the drummer will be able to play them by recognising the sounds of the *bol*s, without much caring for the theory of each syllable of a *bol*, just as, in a language, words and phrases are spoken and written correctly, and particular words are used, simply because they sound well to the ear, irrespective of their grammatical theory,—*e.g.* beside, or besides; of, or off; on, upon; in, within; upward, upwards, &c. The writer or speaker will not in all cases be able to explain and illustrate by examples the grammar of these words. The theory of each syllable of a *bol*, thus differing from practice, the author has not much dilated upon the theory of these syllables of *bol*s. Besides, Gita Sutra Sar is not a treatise on drumming, but "A Theoretical and Practical Treatise on the Art of Singing." The author has thus illustrated mainly the *matra*s and *pada*s of *Tâl*s in their *thekâ* froms. These have been exemplified in his volume.

Tuning of drums. Besides the keeping of time and *Tâl*, the pitch is an important factor in Indian drumming. **For all high class drums**, such as the *tablâ* and the *mridanga*, **the pitch is all-important and this** generally, almost invariably, **is the key-tone**, *i.e.*, these drums are tuned to the key-tone. This key-tone is, as already explained, the middle *sâ* (Do), of the singer or instrument-player (see *p.p.* 3 and 9 *foot-notes*). In the *tablâ*, of the pair, the one played with the right hand, *i.e.* the *diâne* (डाहने), is tuned

to this *sâ* and that played with the left hand, *i. e.* the *bnâyâ* (बांया), is tuned an octave, or a fifth lower. In actual practice, however, much care is generally not taken about the real pitch of the *bnâyâ*. After tuning the *dâine* of the *tablâ*, to the key-tone *i.e.* the middle *sâ*, the *bnâyâ* is so tuned that it appears comfortable and does not jar to the ear, when played simultaneously with the *dâine*. Thus, practically much attention is not paid to its actual pitch, while tuning the *bnâyâ*. Similiarly to the *tablâ*, in the *mridanga* (called *pâkhoâj* (पाखोयाज) in Bengal), the right hand side drum-head is tuned to the middle *sâ*, and the left hand side, theoretically, to an octave lower, but generally in practice, without paying much regard to the actual pitch, the left hand side of the *mridanga* is tuned so that it sounds agreeable to the ear, and gives good resonance when played simultaneously with the right hand side. The tuning of both the right hand instrument of the *tablâ* (*i. e. dâine*), and the right hand side drum-head of the *mridanga*, is done by driving the tuning blocks of wood (used as wedges), that are placed within strong leather braces. The driving of these wedges, however, sharpens both ends of the *mridanga*, which is a barrel-shaped drum. After thus tuning the right hand portion of the *mridanga*, for its left drum-head, which generally is of larger size, a mixture of wheat flour (*âtâ*), and water, in the form of a dough, is worked into the middle of this head of the *mridanga*, to lower the tone to the desired amount. The plaster for this drum-head is thus freshly made, each time it is used for accompaniment. In thus tuning, much attention is not paid, as already said to the exact pitch of this left drum-head. The dough is added to, or taken away, and the rest worked into the drum-head until the drum-heads give a good resonance when both are struck simultaneously by the hands, and the two heads together, sound agreeable to the ear. The left side drum-head is commoly tuned an octave lower to the right hand side. For sharpening the pitch of the left drum-head when required in retuning, as in the case of accompanying a singer, with a higher pitched voice, following a lower pitched singer, at first, the right hand drum-head is tuned to the middle *sâ* (Do) of the new singer (by driving in the wedges), and then a portion of the dough is taken away from the left drum-head, or added to it, as required, until both the heads together, sound agreeable to the ear, as spoken above. Similiar to the stringed instruments (see p. 11 foot note) this re-tuning of the drum has to be done whenever one singer is followed by another, with higher or lower voice. This is a very tardy and tedious process and proves tiresome to the audience. Re-tuning of the *mridanga*, for this purpose, is a very lengthy process. First, the right hand-side drum-head is tuned to the middle *sâ* of the new singer, then the dough is further added to or taken away from the left side drum-head and the dough that remains is worked into it, and thereby this head is tuned to the desired pitch. The plasters of both the drums of the *tablâ* and for the right hand drum-head of the *mridanga*, are ready fixed. In some cases these plasters are ready-fixed inside, and thus can not be seen from outside. These ready fixed plasters add to the resonance, but are not necessary for the tuning.

Drumming differs from that of Europe. There is a good deal of difference in drumming in India from that of Europe. I shall conclude this subject by quoting from Mr. Fox Strangways's book. This will show how an European author felt and experienced, after hearing drum accompaniment from actual performances. In speaking of TIME-INTERVAL, Mr. Fox Strangways says, quoting from B. A. Pingle's *Indian Music*:—

"...drum-words (*bol*) are distributed in drum-phrases (*thekâ*), which constitutes the drummer's *memoria technica* for the particular *Tâl*, and in drum-variants (*parand*); the former's duty is to 'keep up' the *tâl*, the latter's to 'swell' it." Mr. Fox Strangways's *Music of Hindosthan* IX, 230.

Speaking of *bol*s including those of *paran* (this is the same as *parand*) Mr. Fox Strangways says:— "The time-value of the stroke is not implied in its name, though the compound *bol*s naturally take longer than the simple. These values have to be learned by watching and noting performance" *ibid.* 233.

Comparing Indian and European drumming this author again says (*ibid. p.* 225 *et seq.*):—

"The drum is used not, as with us, to assert the accent at special moments, or to reinforce a crisis, but to articulate the metre of the singer's melody, or to add variety to it by means of a cross-metre. There are four main elements in drumming: the quality, the intensity, the pitch,.....and the time-intervals.....We do not, on the whole, use percussion much. When we do, we value it, perhaps chiefly for the graduated intensity with which it points the rhythm. We look a little askance at varieties of

quality" (drums, cymbals, triangle &c.)....."Of the pitch we only demand that it should not clash with the pitch of other sounds..... The time intervals of the drum-notes re-inforce as a whole those of the other instruments ; they seldom cross them, and only produce a certain amount of confusion when they do, which, however, may be a useful resource upon occasion.

"In Hindu music the graduated intensity of the sound is very little regarded, either in singing or playing or drumming, because their whole scheme is not accentual, but quantitative. It is true that the first of the bar (the *sam*) is louder than the rest" (the writer takes the *âvarta* as a bar, and its first sound, the *sam*) "often, not always ; but this is not in order that it may, as with us, stand out against other accents, but because two quantitative schemes are apt to coincide there, and two sounds are louder than one. The time-intervals are with them all-important, and show great variety ; it is seldom that more than a few bars, out of hundreds, are drummed in exactly the same way. And the drumming is practically continuous ; it is only occasionally silenced for special contrast. The pitch, again, is all-important, for it is invariably the key-note, and frequently the drum is the singer's only accompaniment. Lastly, a maximum of variety is got into the quality ; and this not mainly by the variety of the instruments. For though there are scores of shapes for drums, tambourines, cymbals, triangles, and so forth, they are not usually assembled together, because concerted music is the exception, not the rule. The variety is got out of the drum, or the pair of drums" (*tablâ*) "themselves. They are played with the full hand and the fingers, rarely with sticks ; there are half a dozen strokes for the right hand and three or four for the left.....These 'notes' are differentiated not by pitch, but quality. They are also articulated by great intricacy of time-interval. For neither of these things has our music any real analogues.....
.....

"TONE-QUALITY. Under a multitude of names there are two main types of drum. The *mridanga*.....and the pair of drums, *tablâ*.....The plaster" (ready fixed for the *tablâ*, and freshly made for the larger drum-head of the *mridanga*)....."adds to the resonance, and seems to be valued for that reason. It is.....retained in the *tablâ*, although it was not necessary here for the tuning, because each drum has only one head, and the braces do all that is wanted.....The different tone qualities are obtained by striking with the full hand, or the several fingers at different places, and by damping or releasing. They are distinguished by names (*bol*). The *tabla* are generally tuned in unision, occasionally at a Fifth from each other ; but there is no idea whatever of 'dominant-tonic' in this tuning. The alternation of sound between the two drums is incessant and instantaneous, so that the two notes merge ; and they are obviously there for the same reason as they are upon the drone strings of the *vinâ* or *tambura*, only as an enrichment of the tone.....On the *tabla*.....there is a special stroke.....which can be made with either hand ; after a blow from the full hand the ball of the thumb is slid forward across the drum-head. This raises the pitch slightly and produces a sound like a galosh leaving the mud, curious, and by no means unattractive.....
.....

"Confining ourselves now to the *tabla*—the *mridanga* is played in the same way—we will examine the different strokes (*bols*) given with either hand or both hands ; singly, successively, or simultaneously ; with one or more fingers or with the whole hand ; upon the 'black', or the 'rim', or upon the 'white' between them ; damped, or partly damped, or undamped. Indian fingers are extraordinarily supple. The forefinger, as pianoforte players know, is one of the weakest ; but its stroke as it comes down flat with a whang on different parts of the drum is curiously powerful, and inimitable by Westerns. It is said to take half a lifetime to make a good drummer.....

"There is considerable difficulty, short of the only true way—by learning to drum oneself—in finding out what these strokes really are. Not only do both strokes and names vary in the North and the names differ entirely in the South, but the drummer regards his strokes as a synthesis, and is not accustomed to analyse them. Also if too many questions are asked, the victim begins at last in sheer desparation to say the first thing that comes into his head." *Music of Hindostan* by Fox Strangways IX 225-228.

SANSKRIT METRES.

Tâla i. e. time, including measures, of Indian Music originated from the metres of sanskrit poetry. Some idea of these sanskrit metres is necessary in order to understand the peculiarities of Indian *Tâls*, as compared with the measures of European Music. In India there are *Vishama Tâls*, which are loosely called unequal time. Strictly speaking, these are not in unequal time, as will be shown in detail hereafter. To appreciate the real nature of these *Vishama Tâls* we should look into the sanskrit metres from which they originated. The detailed rules of sanskrit metres may be found in works on sanskrit prosody, and in sanskrit grammars, and their commentaries. Different books on this subject, however, relate to different stages of growth of the sanskrit language, and modern Indian languages also, do not strictly follow the rules of sanskrit prosody. Thus, these works on prosody do not strictly agree, in all the detailed rules for metres. Without claiming any intimate knowledge of these rules of prosody, I shall only describe here the main features, leaving aside details, of Sanskrit metres, in so far as they are necessary for understanding the modern *Tâls* of Indian music. I shall deal only with the rules for Sanskrit metres from which the *Tâls* originated and shall not undertake to depict the departure of modern Indian languages, as regards prosody, from the original Sanskrit.

There is a fundamental difference between Indian and English poetry* with regard to their metres. In English poetical metres, long or short vowels, or long or short syllables do not count, and accent, *i.e.* stressed, or unstressed syllables, is of much importance. This is unlike Sanskrit metres, where accent is not of any importance, but the number of syllables and also their quantity in time, are taken account of. Though there are no rules for accent, yet as already said, there are rules for *jati* (यति) or rest, in Sanskrit metres. These metres, as already said, (see p. 34) fall mainly into two classes:—(1) *Varnavritta* or syllable-fixed *i.e.* there is a fixed number of syllables in each *pâda* (पाद *i.e.* foot, of a verse); and (2) *Mâtrâvritta*† or time-unit fixed *i.e.* those in which each *pâda* of a verse, has a given time-length which is reached by equivalence *e.g.* by taking a *guru* (long) sound as twice the length in time, of a *laghu* (short) sound. Each verse of sanskrit poetry is divided into four *pâdas* (feet *i.e.* quarter-verses), and each *pâda* of a particular metre, has a fixed number of syllables (वर्ण) in *varnavritta chhandas*, and a fixed number of *mâtrâs* (time-units), in *mâtrâvritta chhandas*. Each syllable, is counted as a unit in *varnavritta* metres, and though in this class of metres there are rules regulating the particular places where *guru* and *laghu* syllables will fall, yet each syllable is counted as a unit, in this *varnavritta* class, regardless of the fact as to whether the syllable is *laghu* or *guru*. In *mâtrâvritta chhandas* on the other hand, for counting the number of units in a *pâda* (quarter-verse) the time value of a *laghu* or *guru* syllable is taken account of. A *laghu* (short) syllable (वर्ण) for this purpose, is counted as one unit, and a *guru* (long) syllable, as two units. Each such unit is called a *mâtrâ*, and a *pâda* (quarter-verse) of a *mâtrâvritta* metre consists of a fixed number of such *mâtrâs*. Thus, in this class of metres, the time values of syllables, and not the number of syllables, are taken account of, for counting the number of units in a verse or in a *pâda* of a verse.

A sanskrit syllable, *i.e. varna* (वर्ण) or *aksara* (अक्षर), consists of, either a vowel, independently used as a *varna* (letter), or of one vowel (simple or diphthong) attached to one consonant (*i. e.* to a single consonant), or attached to one compound, of two or more consonants.‡ There are rules for Sanskrit

* For more detailed comparison, with practical examples of Sanskrit and English metres, see Fox Strangways's *Music of Hindostan*, ch. VIII.

† According to some authorities, the above-mentioned *Varnavritta* class, is called *Vrittam* (वृत्तं) class of metres, and *Mâtrâvritta* class as *Jâti* (जाति) class of metres.

पद्यं चतुष्पदो तच्च वृत्तं जातिरिति द्विधा।
वृत्तमक्षर संख्यातं जातिर्मात्रा कृता भवेत् ॥ शब्दकल्पद्रुमः, on छन्दः

‡ Sanskrit syllables are, of course, one consonant (simple or compound) plus one vowel (simple or diphthong). *Music of Hindostan*, by Fox Strangways viii, 200, foot-note.

metres depicting the particular syllables (वर्ण) that are to be considered *laghu* (लघु, short), and those that are to be taken as *guru* (गुरु, long). A syllable (वर्ण) with a *hrasva* (ह्रस्व) svara (vowel) is *laghu*, *i.e.* a syllable consisting of a *hrasva* vowel independently used, or of a *hrasva* vowel attached to one simple or compound consonant, is **laghu** (short). The *hrasva* (short) vowels are, अ, इ, उ, ऋ, ऌ, and the *dirgha* (long) *svaras* (vowels) are, आ, ई, ऊ, ॠ, ए, ऐ, ओ, औ. Besides this rule of *hrasva svaras* being *laghu*, there is the following rule for *laghu* and *guru* syllables:—Syllables* (i.e. the vowel sound of a syllable) that are in combination with *anusvâra* (ं) and *visarga* (ः), also *dirgha* vowelled syllables (*i. e.* syllables, consisting of *dirgha svaras* independently used, or having *dirgha svaras* attached to them), and syllables (वर्ण) preceding compound consonants (युक्त वर्ण) are **guru** (or long). Besides this, a syllable at the end of a *pâda* (quarter-verse) is alternatively *laghu* and *guru* (according to the requirements and exigencies of a metre), *i.e.* a syllable, though not *guru*, according to the previous rules, may be either *guru* or *laghu* (for the sake of a metre) when the syllable is at the end of a *pâda*.

By different groupings of *laghu* and *guru* syllables, and by various numbers of syllables or of time-lengths of syllables, in a *pâda* (quarter-verse), a large varaiety of Sanskrit meteres are obtained. Besides the rules for *laghu* and *guru* sounds there are, in some Sanskrit metros, rules regulating the particular places where *jati* (यति *i.e.* pause or rest, see p. 47) will occur. In Sanskrit prosody, metres are numerous. I shall next explain only the main classes of them, with a few practical examples.

(1) VARNAVRITTA CHHANDA.

Each verse of Sanskrit poetry is generally divided into four *pâdas* (पाद or quarter-verses). In *varnavritta chhanda*, as alredy said each *pâda* is measured by the number of *varnas* or *aksaras* *i.e.* syllables in a *pâda*. According to the similiarity or dissimiliarity of the *pâdas* within a verse, *varnavritta chhandas* are classified into three principal groups:—(*a*) *Sama* (सम) *i.e.* those in which all the four *padas* (quarter-verses) are similiar, (*b*) *Ardha-sama* (अर्ध सम) or semi-similiar *i.e.* those in which the first *pâda* is similiar to the third *Pâda*, and the second to the fourth: (*c*) *Vishama* (विषम) or dissimiliar *i.e.* those in which all the four *pâdas* are dissimiliar. The dissimiliarity in the *ardha-sama* and *vishama* classes may be formed by, either (*i*) different numbers of syllables in a *pâda*, or (*ii*) though consisting of the same number of syllables, this dissimiliarity may be formed by different groupings of *laghu* and *guru* sounds. This will be found from the practical examples given below. The number of syllables (वर्ण) in each *pâda* of a verse of *varnavritta chhanda* is fixed, and a *pâda* (quarter-verse) may be composed of from 1 to 48, or more syllables I give below a few typical examples of the classes of metres mentioned above.

1 (*a*). *SAMA* (सम) CLASS.

Metre *Sree* (श्रीः) consisting of one syllabled *pâdas*† each of which is *guru*—*e.g.* श्री ः स्ते । सा ः स्ताम् ॥

Metre *Stree* (स्त्री) of *pâdas* of two *guru* syllables each—*e.g.* गोप ः स्त्रीभिः । कृष्णो ः रेमे ॥

Metre *Mrigi* (मृगी), the scanning of each *pâda* of which is — ⌣ —‡ *i.e.* a *guru* syllable followed by a *laghu*, and then a *guru* syllable, thus making three syllables, for each *pâda*. Example:—

सा मृगी ः लोचना । राधिका ः श्रीपतेः ॥

---

* सानुस्वारश्च दीर्घश्च विसर्गीच गुरुर्भवेत् ।
वर्णः संयोगपूर्व्वश्च तथा पादान्तगोऽपि वा ॥ इति छन्दोमञ्जरी ।

†Each half-verse is shown here (as is done in printed sanskrit books), by one upright line |, and the end of a verse by two upright lines ||. Besides these signs, I have used the dotted upright line ¦ to show each *pâda* within a half-verse.

‡The sign — is taken for a *guru* (long) sound, and ⌣ for a *laghu* (short) sound.

Four-syllabled *pâdas*—Metre *Kanyâ* (कन्या). Scanning — — — —. Example :—

भास्वत् कन्या ⁞ सैका धन्या । यस्याः कूले ⁞ कृष्णोऽखेलत् ॥

Metre *Sati* (सती), another four-syllabled metre. Scanning ⏑ ⏑ ⏑ — Example :—

मधुरिपो ⁞ तव पदम् । नमति सा ⁞ ननु सती ॥

Five-syllabled—Metre *Panktih* (पङ्क्तिः) Scanning — ⏑ ⏑ — —, Example :—

कृष्णसनाथा ⁞ तर्णकपङ्क्तिः । यामुनकच्छे ⁞ चारु चचार ॥

Six-syllabled—Example :—Metre *Somarâji* (सोमराजी); Scanning ⏑ — — ⏑ — — *e.g.*

हरे सोमराजी ⁞ समा ते यशःश्रीः । जगन्मण्डलस्य ⁞ क्षिनत्त्यन्धकारम् ॥

Seven-syllabled—Example,—Metre *Madhumati* (मधुमती). Scanning ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — *e.g.*

रविदुहितृतटे ⁞ नवकुसुमततिः । व्यधित मधुमती ⁞ मधुमथनमुदं ॥

Eight-syllabled—Example,—Metre *Chitrapadâ* (चित्रपदा), a variety of *Anushtup* (अनुष्टुप्).* The scanning of this metre *chitrapadâ* is — ⏑ ⏑ — ⏑ ⏑ — — Example :—

यामुनसैकतदेशे ⁞ गोपवधू जलकेलौ । कंसरिपोर्गतिलोला ⁞ चित्रपदा जगदव्यात् ॥

Besides the prescribd rules for scanning for *laghu* and *guru* syllables of a metre, as shown above, there are also, for particular metres, rules for *jati i.e.* pause, or rest, *e.g.* :—

Metre *Sikharini* (शिखरिणी) each *pâda* of it is of 17 syllables. Scanning †⏑ — — — — — — ⏑ ⏑ ⏑ ⏑ ⏑ — — ⏑ ⏑ ⏑ —. In this, there is *jati* after the sixth and eleventh syllables. Example :—

* There are generic names, according to the numbers of syllables (in each *pâda*), for this *Sama* class of metres. Thus, this class of metres, with *pâdas* :—of one sylable each, is called *Ukthâ* (उक्था) ; of two syllables each, *Atyukthâ* (अत्युक्था) ; of three syllables each, *Madhyâ* (मध्या) ; of four syllables each, *Pratishthâ* (प्रतिष्ठा) ; of five syllables each, *Supratishthâ* (सुप्रतिष्ठा) ; of six syllables each, *Gâyatri* (गायत्री) ; of seven syllables each, *Ushnik* (उष्णिक्) ; of eight syllables each, *Anushtup* (अनुष्टुप्) &c,

†In sanskrit, there are verses containing the *memoria technia* for scansion of several metres, *e.g.* for this metre *sikharini* the scansion is depicted by य म न स भ ला गः शिखरिणी. The technical meaning of these letters *ja* (य), *ma* (म), *na* (न) &c., is given in the following verses :—

मस्त्रिगुरुस्त्रिलघुश्च नकारो भादिगुरुः पुनरादिलघुर्यः ।
जो गुरुमध्यगतो रलमध्यः सोऽन्तगुरुः कथितोऽन्तलघुस्तः ।
गुरुरेको गकारस्तु लकारो लघुरेकक; ।
क्रमेन चैषां रेखाभिः संस्थानं दर्श्यते यथा ॥ छन्दोमञ्जरी ।

After describing the technical meanings of the letters used in this *memoria technica*, the sanskrit book on prosody *Chhandomanjari*, quoted above, describes these meanings of the technical terms by showing by signs the consecutive *laghu* and *guru* sounds meant by the letters *ja*, *ma*, *na* &c., used in the text. While reproducing from that text, I have used here the signs used in English works on prosody for short or long sounds. Thus :—the sign ⏑ is taken for *laghu* (short), and—for *guru* (long) sounds, *i.e.* for short or long sounded syllables. With these signs, we have for explanation of the above text :—*ma* (म) — — —; *na* (न) ⏑ ⏑ ⏑; *bha* (भ) — ⏑ ⏑; *ya* (य) ⏑ — —; *ja* (ज) ⏑ — ⏑; *ra* (र) — ⏑ —; *sa* (स) ⏑ ⏑ —; *ta* (त) — — ⏑; *ga* (ग) —; *la* (ल) ⏑. The text, and the signs, thus mean, that three consecutive *guru* sounds are termed *ma* (म), or *ma gana* (म गण); three consecutive *laghu* sounds are termed *na* (न) &c. By using these meanings, the scansion *ya ma na sa bha la ga* (य म न स भ ल ग) for metre *sikkarini* will be found to agree with the consecutive *laghu* and *guru* sounds, as shown above. Mr. Fox Strangways, while dealing with sanskrit metres, is not very clear about the meanings of these technical terms. He is also not strictly accurate in detail. See his *Music of Hindostan* ch. VIII, also pp. 196—197 of that chapter.

कारादस्य भ्रष्टे ननु शिखरिणी दृश्यतिशिशो विलीना: स्म: सत्यं नियतमवधेयं तदखिलै: ।
इति व्यस्त्रोपानुचितनिभृतालापजनितं स्मितं बिभ्रद्देवो जगदवतु गोवर्द्धनधर: ॥

There are various similiar metres of this *sama* class of *varnavritta chhanda*, of from 1 to 48, or more syllables in each *pâda*.

1 (*b*). *ARDHA-SAMA* (अर्द्धसम) CLASS.

In this class, as already said, the first *pâda* is similar to the third, and the second to the fourth, as for example :--

Metre *Sundari* (सुन्दरी). The first and third *pâdas* of it, are of 10 syllables each, the scansion of each of which is ⏑ ⏑ — ⏑ ⏑ — ⏑ — ⏑ —; and the second and fourth *pâdas* are of 11 syllables each, ⏑ ⏑ — — ⏑ ⏑ — ⏑ — ⏑ — Example :—

यदवोचदवेक्ष्य सुन्दरी परित: स्नेहमयेन चक्षुषा ।
अपि कंसहरस्य दुर्व्वचं वचनस्तद्विदधीत विस्मयं ॥

The dissimiliarity of the *pâdas* in the half-verses of this *Ardha-sama* class may be formed, as already said, not only by different numbers of syllables, but also by different groupings of *laghu* and *guru* syllables in the *pâdas*, though the numbers of syllables for each *pâda*, remain the same. Thus :—

Metre *upachitram* (उपचित्रं), each *pâda* of it, is of 11 syllables. The dissimiliarity lies in the scanning of the *pâdas*. Thus :—

First and third *pâdas* ⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ — ⏑ —; second and fourth *pâdas* ⏑ — — ⏑ — — ⏑ — — ⏑ ⏑. Example of this metre :—

मुरवैरिवपुस्तनुतां मुदं हेमनिभांशुकचन्दनलिप्तम् ।
गगणस्थचपला मिलितं यथा शारदनीरधरैरुपचित्रम् ॥

Here the letter म् having no vowel attached to it, is not considered as a syllable. The previous compound letters containing the vowel sound and the म् all combined, form one syllable.

1 (*c*). *VISHAMA* (विषम) CLASS.

In this class all the four *pâdas* are dissimiliar. This dissimiliarity, similiar to the 1(*b*), *i.e. Ardha-sama* class, may be formed, (*i*) by difference in the numbers of syllables ; or the numbers of syllables remaining the same, (*ii*) by different groupings of *laghu* and *guru* sounds, as will be seen from the following examples :—

Metre *Lalitam* (ललितं).

1st *pâda* of 10 syllables, ⏑ ⏑ — ⏑ — ⏑ ⏑ ⏑ — ⏑, 2nd *pâda* of 10 syllables ⏑ ⏑ ⏑ ⏑ ⏑ — ⏑ — ⏑ -, 3rd *pâda* of 12 syllables ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — ⏑ ⏑ —, 4th *pâda* of 13 syllables ⏑ ⏑ — ⏑ — ⏑ ⏑ ⏑ — ⏑ — ⏑ — Example :—

व्रजसुन्दरीसमुदयेन मुदितमनसा स्म पीयते ।
हिमकरगलितमिवामृतकं ललितं मुरारिमुखचन्द्रविच्युतं ॥

Metre *Vaktram* (वक्त्रम्).

1st *pâda* of 8 syllables — — — — ⏑ — — —, 2nd *pâda* of 8 syllables — — — — ⏑ — — —, 3rd *pâda* of 8 syllables — ⏑ — — ⏑ — — —, 4th *pâda* of 8 syllables — — — — ⏑ — — —. Example :—

वक्त्राम्भोजं सदा क्षीरं ⁞ चक्षुर्नीलोत्पलं फुल्लं ।
वक्षश्चोनां मुरारातेः श्वेतोभृङ्गं जहारोच्चैः ॥

Here the dissimiliarity lies in the different groupings of *laghu* and *guru sounds* in the *pâdas*.

(2) MATRAVRITTA CHHANDA.

As already said, each *pâda* of a *Mâtrâvritta chhanda*, is measured by a time length, which is calculated, as containing so many *mâtrâs* or time-units. A *laghu* (short) sounded syllable is taken as one *mâtrâ* and a *guru* (long) sounded syllable, as twice a *laghu i. e.* two *mâtrâs*. Thus :—

Metre *Pajjhatikâ* (पज्झटिका).

In this metre each *pâda* is of 16 *mâtrâs*, or time units. In this class of metres as already spoken of, the time-value (*mâtrâ*) of a syllable, (and not the numbers of syllables), is counted as a unit. Example :—

मा कुरु धन जन यौवन गर्व्वं ⁞ हरति निमेषात् कालः सर्व्वं ।
मायामयमिदमखिलं हित्वा ⁞ ब्रह्मपदं प्रविशाशु विदित्वा ॥

By different groupings of *laghu* and *guru* sounds, there may be various forms of this metre. The scansion of the above example is :—1st *pâda*, — ⏑ ⏑ ⏑ — ⏑ ⏑ ⏑ — ⏑ ⏑ — —, 2nd *pâda*, ⏑ ⏑ ⏑ ⏑ — — — — — —, 3rd *pâda* — — ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — — —, 4th *pâda* — ⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ — —.

The following is another example of this metre, *Pajjhatikâ*, having a different scansion :—

तरलवतंसाश्लिष्ट स्कन्धश्चलतर पज्झटिका कटिबन्धः ।
मौलिचपलशिखिचन्द्रक वृन्दः ⁞ कालियशिरशि ननर्त्त मुकुन्दः ॥

The Scansion* of the above example is as follows :—1st *pâda* ⏑ ⏑ ⏑ ⏑ — — — — — —, 2nd *pâda* ⏑ ⏑ ⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ — —, 3rd *pâda* — ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — ⏑ ⏑ — —, 4th *pâda* — ⏑ ⏑ ⏑ ⏑ ⏑ ⏑ — ⏑ ⏑ — —.

In the above example all the *pâdas* of a verse have equal *mâtrâs*. *Mâtrâvritta chhandas* (metre) may also have *pâdas* of different numbers of *mâtras* within a verse, and there are rules for *jati* (यति) in this class of Metres also, Thus :—

Metre *Pathyâ* (पथ्या), a variety of *Aryâ* (आर्य्या) or *Gâthâ* (गाथा *i. e.* devotional songs).

जय जय नाथ मुरारे केशव कंसान्तकाच्युतानन्त ।
कुरु करुणामिति विनतिः ⁞ पथ्या भवरोगदुःस्थानाम् ॥

The scansion of this metre is, 1st *pâdâ* of 12 *mâtrâs* ⏑ ⏑ ⏑ ⏑ — ⏑ ⏑ — —, 2nd *pâda* of 18 *mâtrâs* — ⏑ ⏑ — — ⏑ — ⏑ — — —, 3rd *pâda* of 12 *mâtrâs* ⏑ ⏑ ⏑ ⏑ — ⏑ ⏑ ⏑ ⏑ —, 4th *pâda* of 15 *matrâs* — — ⏑ ⏑ — ⏑ — — —. In this metre there is *jati* (यति or rest) after the 12th *mâtrâ*, in the 1st and 3rd *pâdas*.

In the above example, it will be seen, the short vowel (*hrasva swara*) of the last syllable in the 2nd *pâda*, would ordinarily be a *laghu* sound, but it is considered here a *guru* sound. This is in accordance with the rule already quoted (see p. 48) तथा पादान्तगोऽपि वा *i. e.* (sounds of) syllables at the end of a *pâda* (quarter-verse), are alternatively *laghu* or *guru* (according to the exigencies of a metre).

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* N. B.—In *Mâtrâvritta Chhandas*, as spoken before, a *laghu* sound is to be counted as one *mâtrâ*, and a *guru* sound as two *mâtrâs* (time units). By counting in this way, it will be found that each *pâda* is of 16 *mâtras* each, in *Pajjhatika* metre.

Metre *Chapalâ* (चपला)—another form of *Aryâ chhanda.*

चपला न चेत् कदाचिन्नृणां भवेन्नास्ति भावना कृष्णे ।
धर्म्मार्थकाममोक्षास्तदा करस्था न सन्देहः ॥

The scansion of this metre is :—1st *pâda* of 12 *mâtrâs* ⏑ ⏑ — ⏑ — ⏑ — —, 2nd *pâda* of 18 *mâtrâs* ⏑ — ⏑ — — ⏑ — ⏑ — — — —, 3rd *pâda* of 12 *mâtrâs* — — ⏑ — ⏑ — —, 4th *pâda* of 15 *mâtrâs* ⏑ — ⏑

There are many varieties of *âryâ* metre, in which the numbers of *mâtrâs* in particular *pâdas*, and the combinations of *laghu* and *guru* sounds are different in the different varieties.

Sanskrit metres, both *varnavritta*, and *mâtrâvritta* are numerous, formed by different numbers of syllables of or, *mâtrâs* in their *pâdas*, and also by various combinations of *laghu*, and *guru* sounds. The rules for the metres and their classifications that I have quoted here, are from the text book on sanskrit prosody *Chhando-manjari* (छन्दोमञ्जरी). The few practical examples of metres and their scansions, that I have quoted above, in order to illustrate the main classes of sanskrit metres, have been generally taken from the sanskrit lexicon *Sabdakalpadruma* (शब्दकल्पद्रुमः) by Radhakanta Deb, Calcutta. While dealing with metres (*chhanda*), *Sabdakalpadruma* has freely quoted from *Chhandomanjari*. For more detailed rules, and various examples of sanskrit metres, both the books should be referred to.

TAL.

Tâl has already been explained (see pp. 34-37). In that connection it has been mentioned that *Tâl* originated from the metres of Sanskrit poetry. If the nature of the sanskrit metres that I have already quoted and explained, be looked into, the principles of Indian *Tâls* would not be very difficult to grasp. Europeans often find it difficult to follow the peculiarities of *Tâls*, especially *Vishama* (विषम) *Tâls*, as compared with the Time, and Measure of Europe. The *Tâls*, which appear to them to be in unequal time, or in measures of 5, 7, &c. (see *Tâls Jhâmptâl*, *Teorâ* &c. from the practical examples at *post.*) they think to be difficult to perform. From the practical examples of Sanskrit metres that I have already quoted, it will be seen that this unequal time, and the uneven measures, are the parts and parcels of sanskrit poetry. Indian songs originally reckoned time (1) by syllables (*aksara* अक्षर or *varna* वर्ण), and (2) by *mâtrâ*, by following the rules of poetry. Music, however, outgrew its strict adherence to rules of prosody,* and *Tâls* of different groups of *mâtrâs* (time-units) were formed. The author has traced many modern *Tâls* from ancient sanskrit metres, and in this he has made much research work. In this Chapter, I shall relate only what would be necessary, for understanding the structure of, and for actually performing, Indian *Tâls*. For further detailed descriptions as to how the *Tâls* originated from Sanskrit metres, Vol. I. of the author's book (*Gita Sutra Sâr*), especially chapter XII of that Vol. should be referred to.

It has been already said, that *Tâls* (of modern Indian music) are *mâtrâvritta i. e.* their rhythms are measured by time-units. Originally *laghu* and *guru* syllables, were placed in Sanskrit songs, at short and long *mâtrâs*, though not in strict proportional time-units. Latterly, and in songs in modern Indian languages, these long or short time-units, for *guru* or *laghu* (sounded) syllables, were discarded. Thus, in modern Indian songs, a *guru* sound may be, and are very often, actually sung in a short time-unit (*mâtrâ*) and a *laghu* sound may be prolonged, in the course of singing, to more than one *mâtrâ* (time-units), in order to suit the exigencies of *Tâls*. The rules for *Jati* (यति) or rest of Sanskrit metres are also not followed in *Tâls*. **Rests are not** also **prominently shown in notations for Indian** song **music,** as the singer's rests occur in such places as would suit the exigencies of the song, or of the rhythm (*e.g.* at *sam*, see p. 36). *Tâl*, thus came to be guided by rules of accent, and of the number of *mâtrâs* within a measure. It discarded the rules of, either the number of syllables, that a *pada* (subordinate part), or an *âvarta* (principal part) is to contain, or the rules for *laghu* or *guru* sounds of the syllables (*varnas*), in the words of songs.

MATRA subdivision of TALS done by author. The practical illustrations of *Tâls* given hereafter, are the normal, or *thekâ* forms of these *Tâls*, in which, as already said, skilled musicians, introduce, from time to time, variations and cross-rhythms, in actual performances. When the author compiled these *Tâls*, there was not the practice, in any appreciable extent, of illustrating and explaining the *Tâls* by any writing in notation. During the author's time (and this is the case with some musicians at the present day also), singers, instrument players, and even drummers had to learn music *vivâ voce*, without the help of any written music in notation. Drummers used to learn (and some still do the same) and practice *Tâls* with the help of *bols*, without much idea of the exact number of *mâtrâs* within a *pada* or *âvarta* of a *Tâl*. This ignorance could go on as long as music was learnt and taught only *vivâ voce*. To write a music in notation, as the author had done, the structure of the *Tâl* of the music, must, in any case, be properly grasped, and the knowledge of the exact number of *mâtrâs* and their ratios, in each *pada*, and in each *âvarta*, is a necessity. During the author's time, the idea, of the exact number of *mâtrâs*, within the *padas* or even in the *âvartas* of particular *Tâls*, was very loose and imperfect. The author was one of the pioneer compilers of written Indian music, in notation, and for this purpose he had to thoroughly grasp the structure of the *Tâl* of each music, and had to learn the theory of the exact number of *padas* within each *âvarta* of a *Tâl*,

*In this there is a similiarity with that of Europe. "In former times (for instance, in the music of the Greeks, and during the middle ages), the rhythm of music had not yet arrived at an independent development, but depended chiefly upon the rhythm of poetry" *Universal School of Music* by A. H. Marx, English translation by A. H. Wehrhan, Part II, p. 65.

and the exact number of *mâtrâs* for each *pada*. In allotting the number of *padas* for each *âvarta*, and the number of *mâtras* for each *pada*, of a *Tâl*, the author found a good deal of difference of opinion amongst his contemporary musicians, and writers. Being unable to accept the opinion, in theory, of many of his contemporaries, as these theories differed from what he found in the practice of reputed Indian Musicians, the author, with a view to discover the correct original forms of *Tâls* sought what was laid down in Sanskrit text books on metres, and on music. The author did not get much help from these books. As these text books, and the opinion of his contemporaries did not much help him, the author had to discover the theory of the number of *padas* of particular *Tâls*, and the number of *mâtrâs* in each *pada*, from the actual performances of reputed Indian musicians. The sub-division into particular number of *padas*, and the mathematical ratios of *mâtrâs*, for each *pada*, for many of the *Tâls* were the author's own original work. He thereby made it possible for much of Indian music to be compiled and written in notation.

Name and structure of author's TALS differ from those of others. In subdividing the *âvarta* of particular *Tâls* into *padas*, and in allotting particular number of *mâtrâs* for each *pada*, the author, as already said, had to differ from his contemporary musicians and authors. The practical illustrations of some of the author's *Tâls* given hereafter, will thus be found to vary from those of other authorities. The author, as already said, compiled from what he found in actual practical performances, and a good deal of controversy for particular *Tâls*, is not yet at an end, *e. g.* in the Bengali monthly periodical (on music) *Sangit Vijnan Praveshikâ* (of Bengali year 1333 *i. e.* 1926-27 A. D., published from Calcutta), a discussion was carried on as to whether *Tâl Arâthekâ* (पाड़ाठेका) consisted of 16, or 9, or of 18 *mâtrâs*. Though the theory, of the number of *padas*, and of *mâtrâs* within a *pada*, as adopted by the author, was much criticised at his time, yet the author's opinion was subsequently generally accepted, and it is not now disputed by the general mass of reputed musicians of Northern India. It has already been said, that the author deals only with the music of Northern India. The names of the *Tâls* differ in different parts of India. Thus, not only in structure and form, but also, the names of some of the *Tâls* as given by the author, will be found to differ from those given by other authorities. This divergence exists, not only in different parts of India, but also within Northern India, of which part of India only, the author compiled his music. The structures and shapes with which the author has illustrated his *Tâls*, will also be found to differ from those of other authors and compilers. To suit the convenience of drum accompaniment, the author, as already said (see pp. 37-38) has shown each *pada*, and not each *âvarta* as a bar. This subdivision of each *pada* as a bar, is not much inconvenient for *sama Tâls*, the *padas* within whose *avartas* are equal. For *Vishamâ Tâls*, however, the *padas* of which are unequal, the writing down of each *pada* as a bar, may produce some confusion, especially to an European. In this form, they may appear to be in unequal time, and some explanation is thus necessary for *Vishama Tâls*. I shall deal with it presently.

Vishama TAL. Each *âvarta* of a *Tâl* may be compared with a verse of a Sanskrit poetical metre. An *âvarta* (like a verse), of a *Tâl*, whether it be a *Sama Tâl*, or a *Vishama Tâl*, is equal in time length, to any other *âvarta* of the *Tâl*. The difference between *Sama* and *Vishama Tâls* lies in the subdivision of *âvartas* into *padas*. The *padas* of *Tâls* may be compared with the *pâda* sub-divisions of verses of Sanskrit metres. Like *pâdas* of *Ardha-sama*, and *Vishama* metres of Sanskrit poetry (see pp. 50-51), the *padas*, within an *âvarta* of a *Vishama Tâl*, are unequal. Thus, as regards an *âvarta* is concerned, both *Sama*, and *Vishama Tâls* are similiar. Both consist of equal divisions by *âvartas*, which go round and round in equal time-lengths in a song, or piece of music.

Vishama Tals not in unequal time. Thus, if the *âvartas* be shown as bars, as some compilers have done,* a *Vishama Tâl* will appear to be in equal time. The way in which the author has written the *Vishama Tâls*, *viz.* by showing the unequal *padas* as bars with different time-signatures, instead of each *âvarta* as a bar, may give the idea, as already said, (especially to an European) that these *Tâls* are in unequal time. From what has been said, it will be seen that the *Vishama Tâls*, like *Sama Tâls*, are not in unequal time, but both consist of equal timed *âvartas*. The only dissimiliarity in *Sama*

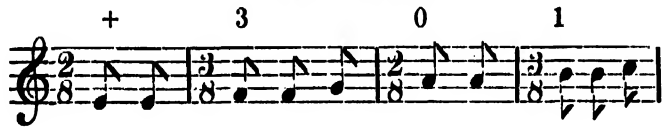
e. g. Mr. Clements in his *Introduction to the Study of Indian Music*, and Mr. Fox Strangways in his *Music of Hindoostan*.

and *Vishama Tâls* lies in the fact, that while the accents within an *âvarta* of a *Sama Tâl*, are regular, in a *Vishama Tâl*, these accents, (within its *âvarta*), are irregular. These will be apparent from the fact that the *padas* of the former are of equal time-lengths, while those of the latter are of unequal time-lengths. The accents fall at the first sounds of each *pada*, thus the *padas* of a *Vishama Tâl* being dissimiliar, the accents within its *âvarta* come at unequal time-lengths.

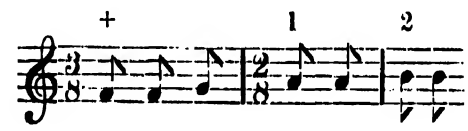
Vishama TALS originited from Sanskrit metres. There are some *Tâls* of the *Vishama* class, in which, within an *âvarta*, the first *pada* is equal in time length to the third *pada*, and the second to the fourth *e. g. Tâls Jhâmptâl, Jat* (see practical illustrations at *post*). These *Tâls* may thus be compared with the *Ardha-sama* class metres of Sanskrit poetry (see p. 50). There is this difference, however between these *Tâls*, and the *Ardha-sama* metres *viz.* that while *Ardha-sama* metres are in *varna-vritta* (syllable-fixed) *chhandas* (rhythms), the former are in *mâtrâvritta chhandas* (time-unit fixed rhythms). There are other *Vishama Tâls*, the *âvartas* of which are neither divided into pairs of similiar *padas* like the above, nor do they consist of four *padas*, *e. g. Tâls Teorâ, Panchama Saodri* &c. (see practical illustrations at *post*). There are numbers of Sanskrit metres, the *pâdas* within the verses of which, are dissimiliar. Some of those have already been illustrated (see *Ardha-Sama*, and *Vishama* metres pp. 50-51). The structure of many of the *Vishama Tâls* of modern Indian music may be traced from some such Sanskrit metre. The author has done some original research work on this subject, and has traced the sources of some *Tâls*, both of the *Sama* and *Vishama* classes, from their original Sanskrit poetical metres. To those who are interested in this subject, I refer to Vol. I, ch. 12, article *Tâl* of author's book.

Vishama TALS not in irregular rhythm. I have already said, that like *Sama Tâls*. *Vishama Tâls* are not in unequal time, but the *âvartas* of both are regularly and rhythmically repeated. Let us take a practical example. Each *âvarta* of *Tâls Jhâmptâl* and *Teorâ* as illustrated by the author, are:—

Tâl Jhâmptâl.

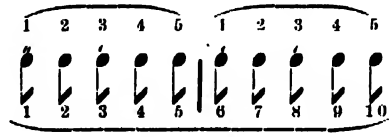


Tâl Teorâ.



The above bars (here *padas*) with different time-signatures, may appear to be in unequal time. Each *âvarta* of the same *Tâls* may be represented thus:—

Tâl Jhâmptal.



Tâl Teorâ.

The double dashes indicate places of strong accent (*sam*), and the single dashes indicate places of light accent, (*tâl*, and *phânk*). By this rearrangement, these *Tâls* will appear as regular measures. By the above method of grouping, *Tâl Jhamptâl* may be said to be in $\frac{5}{8}$ or $\frac{10}{8}$ time, and *Tâl Teorâ*, in $\frac{7}{8}$ time,

Measures like those of Vishama TALS not unknown in Europe. From the groupings as made above, the *Vishama Tâls* may be said to be measures of $\frac{5}{8}$, $\frac{7}{8}$, $\frac{10}{8}$ &c. Europeans, unaccustomed with measures of 5, 7, 10, and such other combinations, may call them irregular and unnatural. English educated Indians, following these Europeans may go so for as to ridicule these measures as unmusical. To them I may say, that these irregular combinations are not altogether unknown even in Europe, and there are European authors who have not only recognised them as natural, but have themselves testified to their merits, as the following quotations will show. Speaking of measures, divided into groups, of 5, 7, 11, 14, &c parts, Mr. A. H. Wehrhan translator of *Universal School of Music*, by A. H. Marx, says:—

"There is a want of proportion in these measures .....For this reason, they are ill-suited to form the rhythmical basis of a whole musical composition. It would, however be too much to condemn them as absolutely *useless* and *unnatural*

(as some theorists have done) they may sometimes be, not only proper, but absolutely necessary, as most strikingly appears from the .....old German song "*Prince Eugenius*" (*Erk's Deutsche Leider*), in which the 5-4 rhythm is quite natural and could not be changed without deforming the music." The writer quotes here the musical piece. Translator's note in *Universal School of music* by A. H. Marx, Part II, sec. 5, p. 88.) Again, the same translator says:—

"..... .....such irregular combinations .....can by no means" be "approved of, if composers make use of them for no better motive than a wish to appear original (what a cheap originality !!) Nevertheless, the real artist should not be denied the liberty of employing such rhythmical combinations, where they present themselves as natural and proper forms of expression. Thus the author" (Marx) "has introduced, in his *Oratorio Mose* (p. 105 of the pianoforte arrangement), a movement for which the 5-4 time was chosen neither arbitrarily nor with an aim at novelty but from necessity, arising, in the composer's mind from his conception of the words and situation," *ibid.* Part II, sec. 6, p. 90.

Capt. Willard, in quoting the following opinion of Dr. Burney from the latter's *General History of Music*,—"Music has been composed of five equal notes in a bar, *but no musician has yet been found that is able to execute it*" has differed from that authority, and has said:—"The authorities of Tartini and Dr. Burney are very respectable, yet we may satisfy ourselves every day that there is *beautiful melody* in Hindustan, comprising *seven* and *other unequal* number of notes in a measure, and that they have musicians in abundance that are able to execute it". Capt. Willard's *Treatise On the Music of Hindoostan*—Ch.—of time.

Vishama TALS compared with European irregular combinations. Measures of 5, 7, 11, 14, &c. parts are unusual and such combinations as, $\frac{5}{4}$, $\frac{7}{4}$ &c. times, are only occasionally used in Europe, to suit a particular feeling, or to suit a particular state of mind coming now and then in the course of a musical piece. ".....considered as forms of our rhythms gone mad they have a definite use, as, for instance, in Tristan's delirium (Act III, sc. ii), where fragments of melodies, his whole past in fact, come thronging disjointedly into his mind." *Music of Hindoostan* by Fox Strangways VIII, 224. This, however, is different from the $\frac{5}{4}$, $\frac{7}{4}$ times of *Vishama Tâls*. The same author continues:—"Only these are not Indian rhythms. They are European rhythms distorted to suit the state of his bodily pulse; it is precisely the pulsation of them that is insisted upon." (*ibid.*) Combinations of 5, 7, &c. parts are neither accidental nor occasional in India, but these measures are the parts and parcels of the rhythms of Indian Music, and as *Vishama Tâls*, the measures are continued throughout a song, or a whole piece of music. Such *Tâls* appear quite natural and musical to an Indian, who is unaccustomed with the Europe musical measures. Says Capt. Willard,—"From the certain knowledge of the rhythm of the ancients, and the similiarity observed in the practices of the natives of India, Persia, and other oriental countries, it inclines one to the opinion that the rhythmical measure is the lawful offspring of nature, found in all parts of the world, which existed much prior to the birth of her younger sister the modern musical measure." Capt. Willard's *Music of Hindoostan*—Ch.—of time. Comparing rhythms of Indian *Tâls*, with European measures, Mr. Fox Strangwas says:—".....In what does the difference between the two systems consist?" "It may be answered that theirs is derived from song, ours from the dance or the march. That both are based on the numbers 2 and 3, but that they add and we multiply in order to form combinations of these. But the answer which goes deepest is that their music is in modes" (*Tâl*) "of time (as we saw also that it was in modes of tune)" (i.e. *Thâts*), "and that ours change that mode at will by means principally of the harmony." "In order that rhythm, an articulation of the infinite variety of sounds, may be upon some regular plan, the plan must have some recognizable unit of measurement. India takes the short note and gives it for a particular rhythm a certain value" (*Mâtrâ*) "as opposed to the long; Europe takes the stressed note and gives it in a particular rhythm a certain frequency as against the unstressed, and graduates its force. We find the unity of the rhythm in the recurrent bar (which is always in duple or triple time, just as our two melodic modes are either major or minor), and have to look elsewhere for the variety; they find variety in the *vibhâg*" (subdivision into *padas*) "whose constitution is, ...extremly various, and must look elsewhere for unity. Both of us find what we want in the larger spaces of time; they find unity in the *âvard*" (*âvarta*) "we find variety in the sections." Fox Strangways' *Music of Hindoostan* VIII, 217-218. The writer goes on:—

"It is sometimes thought that these uneven times—5, 7, 10, 14, and so on—are full of suggestion for European composers. This on the whole may be doubted, because duration is not the same thing as stress", (The author has said before that unlike Indian poetry, "In our poetry we do not know long and short, only stressed and unstressed syllables" *ibid.* p. 192). "All these Indian rhythms have their *raison d' etre* in the contrast of long and short duration, and to identify these with much and little stress is to vulgarize the rhythms", *ibid.* p. 222. If any attempt be made to **harmonise Indian Music**, the above **peculiarities of Vishama TALS should be** carefully **borne in mind.**

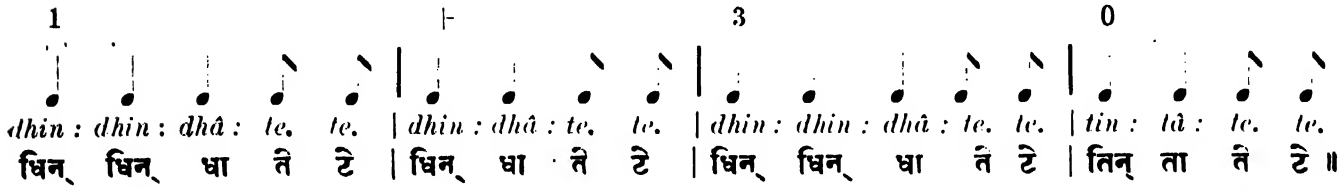
Vishama TALS not unnatural or unmusical. It will thus be seen that *Vishama Tâls* with parts of 5, 7, &c. and other uneven combinations, are neither accidental, nor introduced at places for the

purpose of particular sentiments in a piece of music, but they form parts and parcels of Indian rhythms. It has already been said that there is a similiarity between the dissimiliar *pâdas* (subdivisions) of these *Vishama Tâls*, with the dissimiliar *pâdas*, of *Ardha-Sama* and *Vishama* metres, of sanskrit poetry. Modern Indian languages also abound with metres, the verses of which, contain disimiliar *pâdas*, some of which are quite similiar to a few of the *Vishama Tâls* illustrated by the author. Thus, these *Tâls*, whatever Europeans and English educated Indians may say to the contrary, are neither unmusical, nor do they sound out of the ordinary, to an Indian's ears. They are not also found to be much difficult to perform, by an Indian. Like the *Sama Tâls*, the *Vishama Tâls*, are practised with the help of *bols*. The *bols* of some of the common *Vishama Tâls*, as illustrated by the author (as already said in the *thekâ* forms) are given below :—

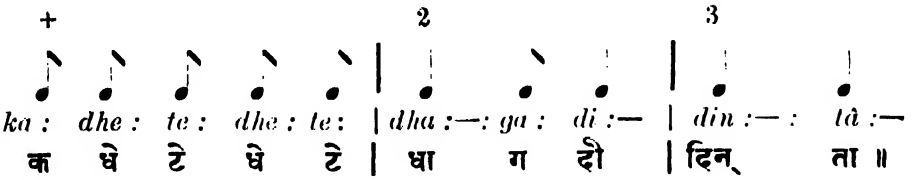
Tâl Jhâmptâl. (of 2+3+2+3 = 10 *mâtrâs*).

The *bol* of this *Tâl* has already been illustrated (see p. 38).

Tâl Teot (तेओट, of 4 + 3 + 4 + 3 = 14 *mâtrâs*).



Tâl Dhâmâr (धामार, of 5+5+4=14 *mâtrâs*)



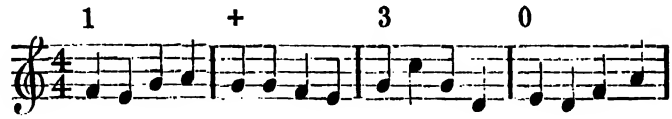
With these, and similiar *bols*,* taught *vivâ voce* in their proper time-lenghts, with or without the help of drum accompaniments, the time of a *Vishama Tâl* is easily learnt and practised by an Indian. While thus practising the different combinations of uneven *mâtrâ* subdivisions, of a *Vishama Tâl*, such a *Tâl* does not look at all formidable to him. Accustomed as he is, with similiar rhythms, in his poetical metres, these *Vishama Tâls* appear as natural to an Indian, as the *Sama Tâls*. I shall now give examples of both forms of *Tâls* as, illustrated by the author.

Cf Time-names, in *The Standard Course*, by John Curwen (Re-writen, J. Curwen & Sons Ld. 1901).

SAMA TALS

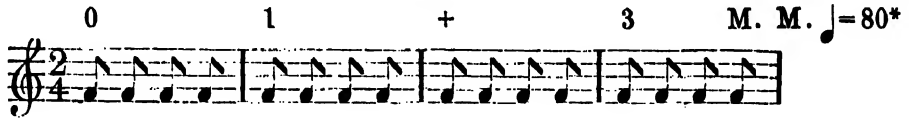
Tetâlâ or *Tintâl* (तेताला or तिन्‌ताल)

This *Tâl*, as already illustrated, (see p. 35) forms the common class of *Tâl*s with 4 *Pada*s of 4 *mâtrâ*s each. Thus the *âvarta* of this *Tâl* is of 16 *mâtrâ*s.



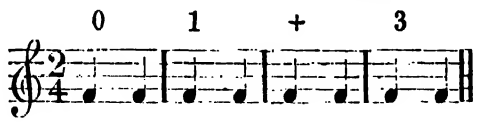
The reason why it is called *Tetâlâ* or *Tintâl*, has already been explained in connection with *sam*, *tâl* & *phânk* (see p. 37). There are some varieties of this *Tâl*, and *Kâoâli*, the most common *Tâl* of Bengal, is one form ot this *Tâl Tetâlâ*.

Tâl Kâoâli (काओाली)



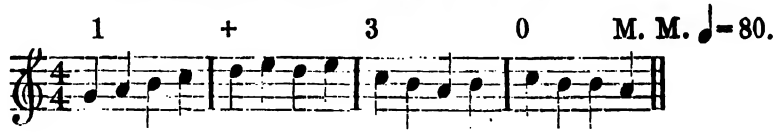
This *Tâl* is a fast form of *Tetâlâ* and consists, like the latter, of 16 *mâtâr*s divided into four *pada*s of 4 *mâtrâ*s each. The examples of different *laya*s previously given (see p. 33), are in this *Tâl Kâoâli*. Each *mâtrâ*, is shown as a quaver here. As already said (see p. 39), each *mâtrâ* may be a fraction or multiple of a quaver, and in different forms, this *Tâl Kâoali* may be formed of 8 *mâtrâ*s, with *pada*s of 2 *mâtrâ*s each, or of 32 *mâtrâ*s with *pada*s of 8 *mâtrâ*s each. In these forms, the time-signatures of this *Tâl* will also vary (see pp. 39—40). In this way, there exists a fast from of *Kâoâli*, consisting of two notes in a bar, instead of four short ones. This is called *Addhâ kâoâli*, as shown below :—

Tâl Addhâ Kaoali (आधा काओाली).



Its speed is faster. Another form of *Tetâla*, slower than *Kâoâli*, is :—

Tâl Dhimâ Tetâlâ (ढिमा तेताला).



This has also been shown at p. 37. It has also 16 *mâtrâ*s with 4 *pada*s of 4 *mâtrâ*s each, but it is slower. As this *Tâl* is difficult to perform due to its slow space, an easier *Tâl* called *Pata Tâl* is performed, and often converged with it. In *Dhrupad* songs (*i. e.* classical and serious forms of songs), the *laya* (*tempo*) of *Tâl Dhimâ Tetâlâ* is very slow, hence very difficult to perform. To make it easier, each *pada* of *Dhimâ*

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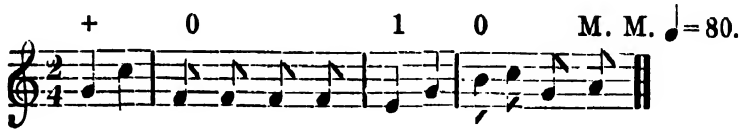
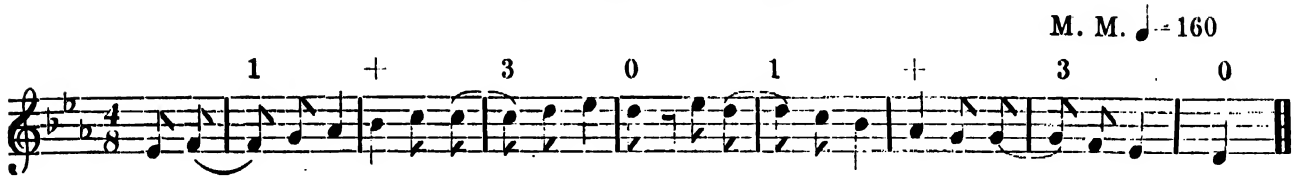
*For meanings of +, 1, 3, 0 &c. See p. 37; for Time-Signatures. as used by the author see p. 39; and for Metronome figures, see p. 40; also for value of each *mâtrâ* in crotchet, quaver &c. see p. 39.

Tetâlâ is sub-divided into two parts, in one of which a *tâl* (see p. 36), and in another a *phânk* is given. In this way *Pata Tâl* is formed. It has four *padas*, formed by the repetition of a *tâl* and a *phânk* as shown below :—

Pata Tâl (पटताल)

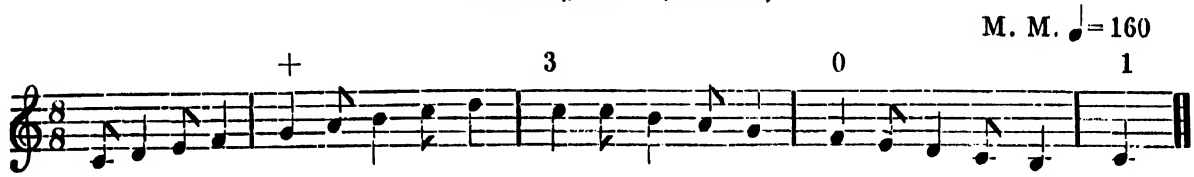


Tâl Arhâthekâ (आड़ाठेका).



In this *Tâl*, there is this peculiarity,—In it, the accents are displaced from the first notes of some *padas*, to the next or other notes, at the discretion of the singer, or in order to suit it to the words of a song. In all other respects it is a *chaturmâtrik Tâl*, a measure of four (see p. 34), some forms of which have already been illustrated. Other forms of accented parts of this *Tâl* have been given by the auother in Vol. I where it has also been shown, how, through change of accent, it is confused with other *Tâls*.

Tâl Madhyamân (मध्यमान).



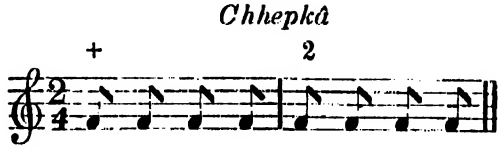
This is a longer form of *ârhâthekâ*, two *âvarta*s of which form one of *madhyamân*, but in the latter the accents are not displaced, and the *sam*, *tâl*s and *phânk* are different, from those of the former, as illustrated above. An *âvarta* of *Madhyamân* is formed of 16 long or 32 short *mâtrâs*. In the above example, (the rhythm of) the *Tâl* 0 begins from the 3rd *mâtrâ* of the 1st *pada*, which is a *tâl*.

Tâls Thungri, Chhepkâ and Kâhârva (ठुंरी, छेपका, काहारवा)

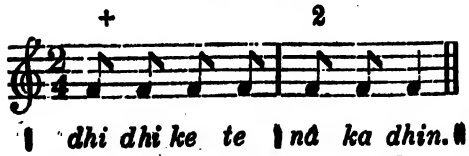
M. M. ♩=100.

Thungri.

Chhepkâ

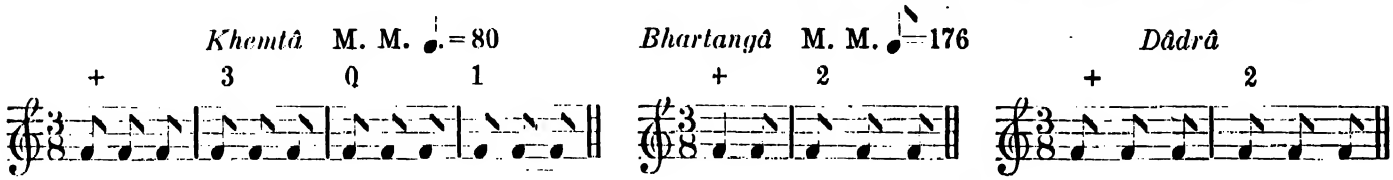


Kâhârvâ



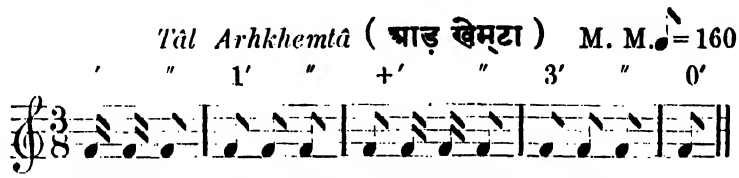
These *Tâl*s are varities of *kâoâli*, the only difference is in their accents, the *sam* of these being in every second *pada*. Thus in these *Tâl*s, two *pada*s of 4 *mâtrâ*s each (half of *kâoâli*) form an *âvarta*. *Chhepkâ* is suited for dance, and *kâhârvâ* is the popular *Tâl* for the folk songs of Hindustan. The *thekâ bols* (see p. 41) of both, are given above.

Tâls Khemtâ, Bhartangâ or Kâshmiri-Khemtâ, and Dâdrâ (खेमटा, भरतंगा या काश्मीरी खेमटा, दादरा)



These are tertiary measures. An *âvarta* of *Khemtâ* consists of 4 *pada*s of 3 *mâtrâ*s each. The other *Tal*s are mere varieties of *Khemtâ*, in which, the accents being at short intervals, they consist of 2 *padas*, with *sam* at every alternate *pada*. *Bhartangâ* or *Kashmiri Khemtâ*, and *Dâdrâ* are the same, the names only differing in different provinces. The only difference lies in their speed. The former is a little slower than *Khemtâ*, while *Dâdrâ* is a little faster. Their *thekâ bols* have been shown above. For producing variety in drumming, *Kâoâli* is often converged (see p. 43) into *Khemtâ* by taking each *pada* (of 3 quavers) of *Khemtâ* as a crotchet of *Kâoâli*, two *pada*s of *Khemtâ* thus forming one *pada* of *Kâoâli*.

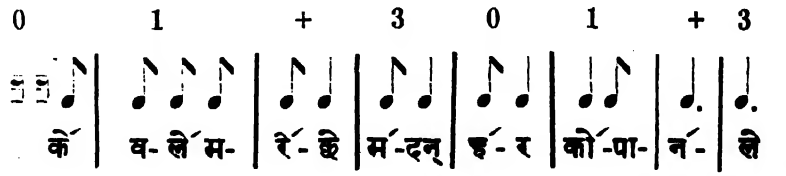
Tâl Arhkhemtâ (आड़ खेमटा) M. M. ♩=160



Like *Khemtâ*, it consists of 4 *pada*s of three *mâtrâ*s each, but it is slower, and (like *Tâl ârhâthekâ*) the accents in *Tâl ârhkhemtâ* are not on the 1st *mâtrâ*. In the *Thekâ* (normal) form of this *Tâl*, as shown above, with the *bol*, weak accents fall on the 1st and heavy accents on the third *mâtrâ* of each *pada*. These are shown by single and double dashes respectively. In the sanskrit alphabet, there are five phonetic groups of letters, named after the initial letter of each group, called *varga* (वर्ग). Thus क ख ग घ ङ is *ka* (क) *varga*, त थ द ध न is *ta* (त) *varga*. In Hindusthani *bols*, **the fourth letter of a varga**, a *mahâprâna varna* (**महाप्राण वर्ण**),* **generally represents** a place of **heavy accent**. As the sanskrit letters ट and त cannot be properly represented by Roman letters, the above *bol* has not been transliterated in Roman letters.

It has already been said, that a singer often introduces variations in the rhythm of a song (p. 42). **One and the same song** also, **may** be, and **often is, sung in different TALS,** and in this way one *Tâl* of a song converges into another. In the following example, the same (Bengali) song (in Devanagar characters) is shown both in *Tâls khemtâ* and *ârhkhemtâ*. Songs in *Tâl ârhkhemtâ*, generally contain two *varna*s (syllables , p. 47) in each *pada*, of which the 1st is generally *laghu*, and the 2nd *guru*. In the course of variations, from the *thekâ* forms, that are often introduced in the rhythm of this *Tâl*, in course of singing, a song is often begun at the last *mâtrâ* of the *phânk*, and strong accents (and a little rest) are introduced in the *sam*, as will be seen in the following example, in which the accented *varnas* are shown by single dashes.

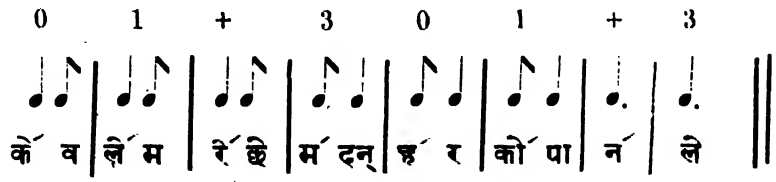
Tâl Arhkhemtâ :—



*In Sanskrit, the 2nd and 4th letters of the *vargas*, and ग घ स ह are *mahâprâna* (aspirated), while the 1st, 3rd, and 5th letters of the *vargas* and य र ल व are *alpaprâna* (unaspirated) *varnas* (letters).

There is accent on the 1st *varna*, and on every third *varna* after that. By placing the 1st *varna* in the 1st *mâtrâ* of the *pada*, the same song takes to *Tâl Khemtâ* :—

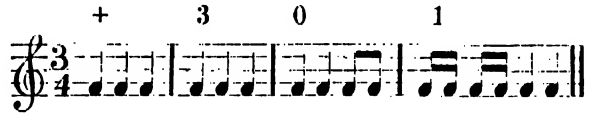
Tâl Khemtâ (खेम्टा)



In this way, by redistributing the accents on *varnas* of the words, of a song, amongst the *mâtrâs* of *padas*, and thereby varying the accents of the *mâtrâs* (this is called singing in *ârh* आड़ form), a song in *Tâl Khemtâ* may be sung in *ârkhemtâ*.

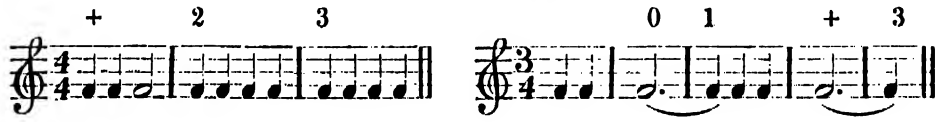
Tâl Ektâlâ (एकताला)

M. M. ♩ 138



It is also a tertiary measure with 4 *padas* of three *mâtrâs* each. The number of *varnas* of the words of a song in a *pada*, are more, (generally three), in *Tâl Ektâlâ*, while in *Khemtâ* and *ârhkhemtâ*, they are generally one, or two. Unlike *ârhkhemtâ*, heavy accent falls on the 1st, and light accent falls on the third *mâtrâ* in a *pada* of *Ektâlâ*, and when there are only two *varnas* in a *pada* of the latter, the 1st is *guru* (of two *mâtrâs*) and the second *laghu* (of one *mâtrâ*, see p. 47,) while in *ârhkhemtâ* the 1st *varna* is *laghu* and the second *guru*. For showing skill and variety, *Ektâlâ* is sometimes converged into three *padas* of 4 *mâtrâs* each. Where the number of *varnas* are small in the *padas*, *Ektala*, in such cases, sometimes takes the form of *ârhkhemtâ*. Both these forms of *Ektâlâ* are illustrated below :—

Varieties of *Ektâlâ*.

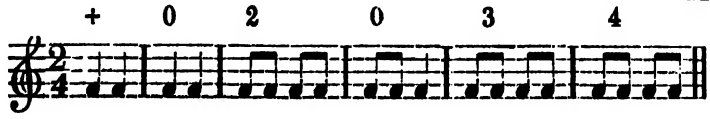


Tâl Chautâl (चोताल, अथवा चारताल)

This *Tâl*, in different *layas*, and its *thekâ*, *paran*, *tehâi*, and *bols*, and the convergence of *Ektâlâ* into this *Tâl*, have already been illustrated at p. 43. The *thekâ* form of this *Tâl* is given below. It consists of 6 *padas* of two *mâtrâs* each. The *padas* consist of, two *phânks* and, including the *sam*, four *tâls*. Hence it is called *Chautâl*, which word connotes four *tâls*. This *Tâl* is suited for *Dhrupad* songs.

Tâl Chautâl.

M. M. ♩ = 100

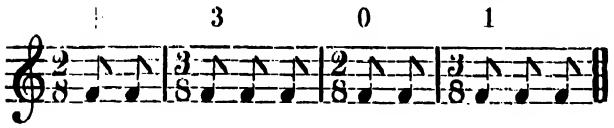


VISHAMA TALS.

The theory of *Vishama Tâls* and their time signatures have already been explained. The following illustrations of these *Tâls* will suffice. I shall give only brief explanations where necessary.

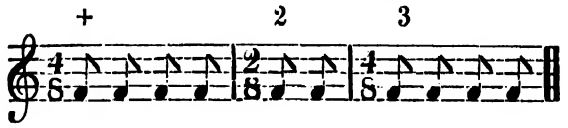
Tâl Jhâmptâl (झाँपताल, वा झपताल)

M. M. ♪ = 200



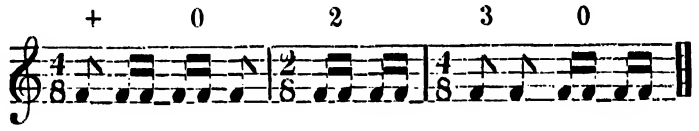
Tâl Surphâktâl (सुरफाकताल)

M. M. ♪ = 176



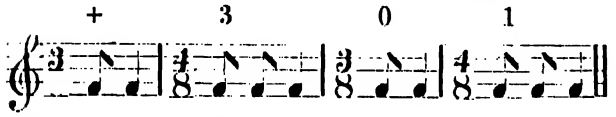
Jhâmptâl, the most common form of *Vishama Tâl*, has already been explained (p. 38). *Surphâktâl*, as shown above, is the ordinary form of that *Tâl*. To make its *laya* (*tempo*) easier to play, or perform, the *padas* containing 4 *mâtrâs* are subdivided, and *phânks* placed at every third *mâtra* of these *padas*, and *surphâktâl* has then the following form:—

Surphâktâl,——easier form.



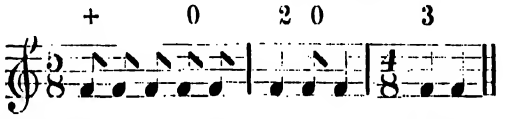
Tâl Jat (यत् ताल).

M. M. ♪ = 208



Tâl Dhâmâr (धामार ताल).

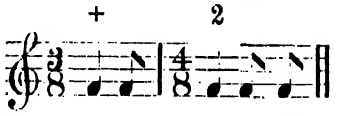
M. M. ♪ = 192



Dhâmâr and *Jât* are the same, only the groupings of their *padas* are different. By slackening the speed of *Jat* and making its *padas* longer to suit *Dhrupad* songs, *Dhâmâr* has been formed out of the former. Both of them can be inter-changed with each other, in course of performance. To keep up the time of the lengthy 5 *mâtrâ padas* of *Dhâmâr*, portions of these lengthy *padas* (*tâls*) are used as *phânks*. These *phânks* have been shown above, without subdividing each long *tâl* into two bars.

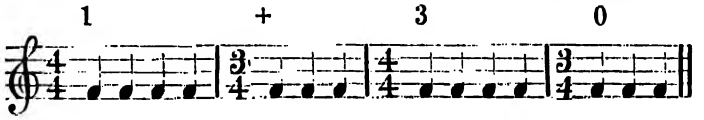
Tâl Postâ (पोस्ता ताल).

M. M. ♪ = 208



Tâl Teot (तेओट ताल).

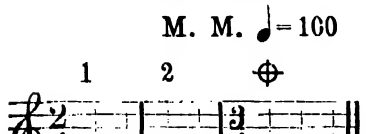
M. M. ♩ = 112



As *Thungri* is half of *Kâoâli*, in SAMA *Tâls*, so *Postâ* is half of *Jat*, having *sam* at every alternate *pada*. *Teot* and *Jat* are similiar in every respect, both having *âvartas* of 14 *mâtrâs*, with alternate *padas* of 3 and 4 *mâtrâs* each, their only difference being, *Teot padas* are slower, and songs in this *Tâl* contain larger number of *varnas*, and its *sam* is preceded by a *pada* of 4 *mâtrâs*, while songs in *Tâl Jat* begin with the *sam*.

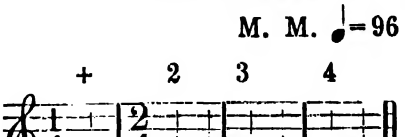
Tâl Roopak (रूपक).

M. M. ♩ = 100



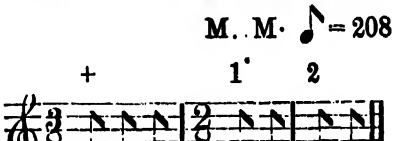
Tâl Arâ-Chautâl (आड़ाचौताल).

M. M. ♩ = 96



Tal Teorâ (तेओरा, वा तीव्रा).

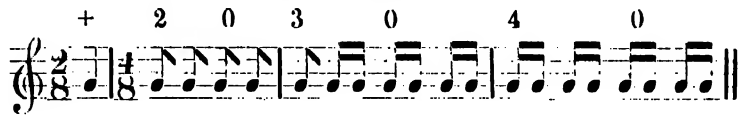
M. M. ♪ = 208



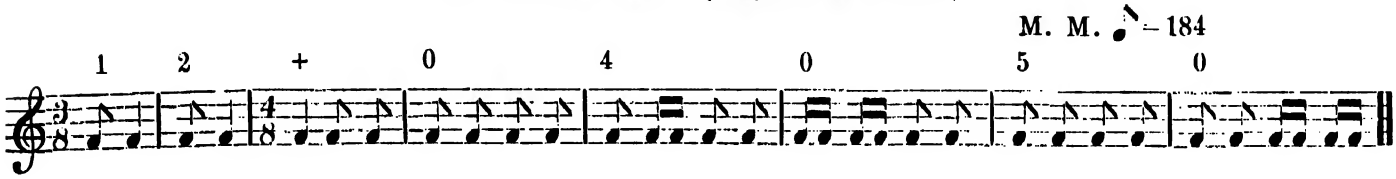
The *âvartas*, of each of these *Tâls*, contain 7 *mâtrâs*, divided into 3 or 4 *padas*. Their speed and the groupings of *mâtrâs* within *padas*, and places of *sam* are different, as shown above. *Roopak* is half of *Teot* but slower in speed, and the *padas* of *Teot* containing 4 *mâtrâs*, are subdivided into *padas* of two *mâtrâs*, in *Roopak*. Songs sung in *Teot* can be drummed in *Roopak Tâl*, and *vice versa*. *Ustâds* (*virtuosos*) sometimes use

the place marked ⊕ as a *phânk* and not as *sam*, in *Roopak*. To indicate its dual character of *sam* and *phânk*, this place has been marked with the sign ⊕ in the above illustration. This double capacity does not exist in *Teorâ*, where the *sam* is not used as a *phânk*, otherwise its rhythm is the same as that of *Roopak*. *Teol* is however faster, and hence suitable for songs with smaller numbered *varnas* within *padas*. By slackening the pace of *Roopak*, and subdividing its *pada* of three *mâtrâs*, into one, of 1 *mâtrâ*, and another of 2 *mâtrâs*, and thereby dividing the *âvarta* into 4 *padas* *Arâchautâl* (smaller *chautâl*, lit. having 4 *tâls*) has been formed out of *Roopak*. Says the author, (at Vol. I ch. XV, p. 193), **"Hindi songs are not bound by any"** hard and fast **"rules of rhythm**. Songs in *Roopak* are sung by *ustâds* (*virtuosos*) in *ârâchautâl*, and *vice versa*". *Arâchautâl* is suitable for *Dhrupad* songs. To suit its slow speed, and to make it easier for performance, a variety of *ârâchautâl* is formed by subdividing its 7 *mâtrâs* into 14, and by using the 3rd *mâtrâ* of the 2nd, 3rd, and 4th *padas*, as places of *phânk*, thus :—

Arâ-Chautâl (another variety)



Tâl Panchamsaoâri (पञ्चमसवारी ताल)



This *Tâl* is of 30 *mâtrâs* divided into two *padas* of 3 *mâtrâs*, followed by six *padas* of 4 *mâtrâs* each altogether eight *padas*, with *sam* at the 3rd *pada*, and *phânks* at the 4th, 6th, and 8th *padas*, and besides the, *sam*, *tâls* at the rest of the *padas*.

The above are illustrations of the *thekâ* of forms of SAMA and VISHAMA *Tâls*, ordinarily in use in Hindustan. The author has mentioned some more varities, and has given more detailed theories of construction, and *thekâ bols* of all these *Tâls* in Vol. I. Some *bols* have aleady been exemplified at pp. 43—44. In the above illustrations of *Tâls*, a *pada* has sometimes been shown, in combinations, of quavers or semiquavers, in order to suit these *thekâ bols* of Vol. I. Most of the *Tâls* shown above, will be found illustrated in the music of the present volume. Besides these, the author has mentioned in Vol. I., some more difficult *Tâls*, which are sometimes performed by musicians, to show off their skill. As these rare *Tâls* are neither pleasant, nor illustrated by music in this Vol. II, I have not shown them here.

Liberty in rhythm, in Indian Music. It has already been said, that, Hindustani songs are neither bound hard and fast to any *Tâl*, or the rhythm of a *Tâl*, nor are they expected to be sung, or accompanied by drums, by skilful singers, and players, to any set rhythm. While singing or playing on stringed instruments, the performance is generally enriched by change of *laya* (p. 33), and by introduction of *parans* (p. 42). On this account, it is often difficult, not only to a foreigner, but even to an Indian, not very skilful in the art, to recognise the *Tâl* of a music from actual performances. It has already been said (p. 35) that **accents of TALS are not prominently shown** in singing. Indeed ! to conceal the rhythm while singing, and thereby to make it difficult for the accompanying drummer to recognise the *Tâl*, and thus to put him into confusion, and similiar practices by the drummer, are considered very meritorious by artists, but such practices often lead not only, as already said (p. 42), to the singer misleading the drummer to false steps, and *vice versa*, but also to, as described by the auothor (at Vol. I. Ch. XV p. 196), wrangles between the singer and the drummer, necessitating the presence of a qualified third party, for controlling and checking them.

TALS, suitable for SITAR, and for change of *laya*. Change of *laya* has already been spoken of. *Tâls*, other than *Kâoâli*, (and other varieties of *Tetâla* or *Tintâl*), and *Chautâl*, are not suitable for change to slow, moderate, and double quick *layas*, as the latter are the only two classes of *Tâls*, whose parts are divisible by two, and multiples of two. *Ektâlâ*, converging as it does, to other measures of four, is also capable of such divisions, and therefore, to change of *laya*. As constant change to *vilambit* and *doon layas*, is the life and soul of *sitâr* playing, *Tâls* other than *Kâoâli*, *Chautâl*, and *Ektâlâ* are not used in this (stringed) instrument.

About Indian Musical Forms, Expression, and Some Technical Terms Used in Gita Sutra Sar.

Many musical terms, and methods of Indian music. have already been explained. Of the others, including the technical terms used in musics of this volume, equivalent European names will be given, wherever practicable, in the body of the musics, and those not so dealt with, will be explained here along with the descriptions of some of the Indian Musical Forms, the peculiarities of which require some explanation. With these Forms I am going to deal with next. Musical Forms have largely changed, in different ancient periods, and many modern technical terms are used in quite different senses, from what they signified in ancient times. In ancient Sanskrit texts also, even in one and the same book, the same word will often be found to be used in different technical senses, with relation to different subjects,—*e.g. varna*, means syllable (p. 47). This word has been used in ancient Sanskrit books on music, in the sense of performance of particular combinations of notes (1). In that connection, *Sthâyi Varna* (स्थायी वर्ण) means a single note performed in a broad and detached manner (2). *Sthâyi Varna*, has been used in this sense in Chapter I of *Sangita-Ratnâkar*. That chapter, and a portion of Chapter II, deals with *Gândharva* (गान्धर्व), or *Mârga Sangita* (मार्ग संगीत), *i. e.* music of celestial origin, and classical music (3), while in *Deshi Sangita* (देशी संगीत, *i. e.* provincial music, and music of human composition) which music, is dealt with exclusively in chapter IV of that book (4), by *sthâyi swara* (स्थायी स्वर) is meant. the note on which a *Râga* rests, and on the basis of which it passes to and fro, to other notes (5). *Sthâya* (स्थायः) for *Deshi* music of the same book, means a part in the body of a *Râga* (6). *Sthâyi* in modern Hindustani music, means the first (and introductory) section of a *Râga*. In Bengal, this first section is generally called *Asthâyi* (आस्थायी). I shall next deal with the meanings of a few Forms, and of some technical terms of Modern Indian Music, with occasional references to their ancient meanings.

MUSICAL FORMS

Of Modern Hindustani Music.

Sthâyi, Antarâ, Sanchâri, Abhog. (स्थायी, अन्तरा, सञ्चारी, आभोग) Like the divisions in European Music, into, Introduction, Prelude, Periods, Sections, Figures, Coda &c., a complete Indian melody has four sections, (*tuk* तुक्, or *kali* कलि,) *sthâyi, antarâ, sanchâri*, and *âbhog*. Ordinarily, an Indian melody has only two sections *sthâyi*, and *antarâ*. *Sthâyi*, as spoken above, is the first section. It introduces the melody, generally with tones of the lower and middle octaves, and a few of the upper octave, and it shows the nature of the melody by developing it. After repeated performances of *Sthâyi*, the melody is further developed in the next (2nd) section, called *Antarâ* (अन्तरा), which generally begins with the middle *sâ* (see p. 9, foot note), then rises to, and continues awhile in upper *sâ*, and then in some cases goes to some more higher tones, and then descending to the tones of the *Sthâyi*, it ends and is united with the *Sthâyi*. *Sthâyi* is again repeated, and thereafter the melody passes to the third section, called *Sanchâri* (lite passing, or moving section). *Sanchâri*, taking up generally the upper ones, of the tones of the middle octave used in *Sthâyi*, descends therefrom to the low tones of the lower octave (in case of vocal music, as low as it lies within the compass of the singer). It then ascends to higher tones and ends in the middle *sâ*. *Sanchâri* is then repeated, and *Abhog* is performed, just after *Sanchâri*, without repeating *Sthâyi* between them, as is done after *Antarâ*. In *Abhog* (from *bhoge* भोग,

(1) *Sangita Ratnâkar* (Poona Edition 1896-97 A.D.) I, vi, 1. (2) *ibid.* 1. vi, 2. (3) *ibid.* IV, 1-4, and Kallinatha's commentary. See also *ibid.* II ii, 1-3, and VI, 341, and comm. (4) *ibid.* IV, 1-4. (5) *ibid.* III, 188 *et seq.* (6) *ibid.* III, 95, and comm.

which means gratification with repose), the melody generally ascends from the middle *sâ*, and, passing through some tones of the higher octave, descends and ends in some tone of the middle octave. If so liked, *âbhog* is repeated, and after *âbhog*, *sthâyi* is again repeated, and the melody is completed in *sthâyi*. For long continued performances, the whole thing is repeated again and again, and variations are introduced in the course of these repetitions by change of *laya* (p. 33), of rhythm, and by introduction of cross-rhythms (p. 38), *tân*, *bânt*, &c. *Tân*, *bânt*, &c. mentioned here, will be described later on.

It will be seen, that in all the above sections, middle *sâ* (p. 3 foot-note) is the basis of the lower, middle, and upper octaves (1), and the ascensions and descensions of notes take place, in all cases, on the basis of this middle *sâ*. The reason for this is, as already said (p. 16,) that **the middle sa is the tonic or key note of all scales and modes** of modern Indian Music. In ancient Indian Music, this was not the case, but in that music, the rise or fall to higher or lower octaves, was on the basis of the *ansâ swara* (अंश-स्वर) (2), and for variations with graces and ornaments, especially in the case of *Desi Music* (3), including variations, by moving to and fro in ascensions and descensions through consecutive notes, this was done on the basis of the *sthâyi swara* (4). Not only *sâ*, but for a particular *Râga*, or other classes of music; other notes also (from amongst the notes of the mode of the *Râga*), could be its *ansa*, or *sthâyi swara*.

Ustadi (or Ostadi) melodies, An Indian *virtuoso*, *i. e.* an expert singer or instrument player is called a *ôstâd*, *ustâd*, *kalâvat* or *kâlôât*. Ordinary types of melodies, such as *thunri* (ठुंरि), and theatrical music, are looked down upon by these *ôstâds*, as not befitting their dignity, and there are mainly three types of songs or melodies, called *ostâdi* (*ustâdi*, or *kâlôâti*) songs and melodies, which can claim this exalted position. These three types are :—*Dhrupad*, *Kheyâl*, and *Tappâ* (ध्रपद, खेयाल, टप्पा). They are detailed below.

Dhrupad, Kheyal. Of the three classes mentioned above, *Dhrupad* songs and melodies, are the more exalted, grave, noble, and classical. *Dhrupad* is more extensive, and slower than *Kheyâl*. Thus *Dhrupad* songs contain larger numbers of *varnas*, (*i. e.* syllables), within the *padas* of its *Tâls* and the slower *Tâls*,—*Chautâl*, *Dhâmâr*, *Surphâktâl*, *Jhâmptâl*, *Teot*, *Arâchautâl*, *Roopak*, *Dhimâtetâlâ*, and *Panchamsaodri*, are its suitable *Tâls*, and *mridanga* (also called *pâkhoâj*) is the convenient drum, for accompaniment with *Dhrupad*. It is considered incomplete, unless a *dhrupad* includes (full) four sections, *sthâyi*, *antarâ*, *sanchâri*, and *âbhog*. While *Kheyâl*, being shorter, and faster, contains generally two sections, *sthâyi*, and *antarâ*, and occasionally 3 or 4, but in these cases, its third and fourth sections resemble the *antarâ*. The faster *Tâls*—*Kaoâli*, *Arâchautal*, *Madhyamân*, *Ektâlâ*, *Teot*, and *Jat* are the suitable *Tâls*, and *Tablâ* (including *bnâyâ* and *tablâ* see p. 41), is the suitable drum of *Kheyâl*. When *Kheyâl* is sung broadly and slowly, it is difficult to distinguish it from *Dhrupad*, but it is then recognised from its own particular *Tâls*, spoken above. Every section of *Dhrupad* must have, at least full four *âvartas* of the *Tâl*, while a section of *Kheyâl* may contain less. When the *Sthâyi* (1st section) of a *Kheyâl* contains full four *âvartas* and its *Tâl* is slackend in pace, it becomes indistinguishable from *Dhrupad*. It has already been said, (p. 58) that the faster *Tâls*, such as *Kâoâli* &c., being slackened in pace, have given rise to the slow *Tâls*, such as *Dhimâ Tetâlâ* &c. Similiarly the **Faster Tals** of *Kheyâl* might have been **produced from slow Tals** of *Dhrupad*, by a contrary process. *Kheyâl*, being fast and short, admits to a large extent, *Tân* (तान्, explained hereafter), and *Gitkâri* (गिट्कारी, *i.e.*, slurred *staccato*), but these have not much scope in *Dhrupad*, as the latter is slow. In *Dhrupad*, on the other hand, there is a large field for *bânt*, change of *laya* (*p.p.* 33, 43), *legato*, *portamento*, *tremolo*, and

(1) Indian Music generally, recognises these three octaves only.

(2) S. R. I, vii, 31—32. The *ansa-swara* was also the predominant note, hence it was also called *Vâdi* (ibid.) *Vâdi* (spelt there *Bâdi*) has already been mentioned (at p. 21). (3) *Desi* Music has already been spoken of at p. 64, there spelt as *Deshi*.

(4) S. R. III, 188—190. For practical illustrations of developing, several *Râgas*, on the basis of their *sthâyi swaras*, in the *Kinnari Vinâ*, see S.R. VI, 331—398, and for similiar performances on the *Vansa* (वंश, Bengali बाँशी) *i.e.* Indian flute, see *ibid.* 668—779. For these performances on the *Vinâ* and *Vansa*, *Sthâyi Swara* and *Graha Swara* have been used in the same sense (S.R.VI, 346, and 674, Kallinatha's commentary). The above references are from the edition of complete *Sangita Ratnâkar*, by *Sârangadeva*, with the commentary (named *Kalânidhi*) of *Kallinâtha*, edited by *Mangesa Râmakrishna Telanga*, *Anandâsram Press*, *Poona*, 1896—97 A. D. The meaning of the abbreviations used by me would be obvious ; *e. g.* S. R. I, vii, 31—32, means Chapter 1, Prakaran (*i. e.* Sub-Chapter, or Section) 7, verses 31 to 32 of the above edition of *Sangita Ratnâkar* ; S. R. VI, 323—330 means, verses 323 to 330 of Chapter 6 of the same book. Similiar abbreviations will be used hereafter, *e. g.* S. R. VI, 346 Commt. will mean, the above-mentioned commentary of *Kallinâtha*, on verse 346, of Chapter 6, of above book. R. V. will mean *Râga-Vibodha* &c.

other embellishments, especially the grace. As, unlike *Dhrupad*, *Kheyâl* freely allows, *ad libidum* passages performed *ex tempore*, with *Tân*, and *Gitkâri*, it is called *Kheyâl*, which literally means whim.

Tappa (टप्पा) comprises lighter forms of music. It is faster in time than *Dhrupad* and *Kheyâl*. *Tappâ* contains two sections, *Sthâyi*, and *Antarâ*, and most of the *Kheyâl Tâls*, can be used in *Tappâ*.

Thunri (ठुंरि). Songs sung in the *Râgas* used for *Tappâ* songs, and in *Tâls* *Addhâ-Kâoâli* and *Thunri*, are called *Thunri* songs. There are varieties of *Thunri*. Those sung in *Tâls* *Khemtâ*, *Kâhârvâ*, *Dâdrâ* &c. are called *Khemtâ*, *Kâhârvâ*, *Dâdrâ* &c. songs, respectively. In *Thunri* songs there is much more freedom of the singer, for introducing variations and *ad libidum* passages, than in *Kheyâl* or *Tappâ*. There is another peculiarity of *Thunri*. In it, even in one section (*sthâyi* or *antarâ*) different *Râgas* are so beautifully blended together, such as *Râga Bhairavi*, or *Sindhu*, or *Pilu*, or *Lum*, or *Vehâg*, with *Khâmbâj*, and for this purpose, and for other variations, there are such transitions to different Keys, thereby modulating to *thâts* other than the prescribed *thâts* of *Râgas*, (although this is generally unknown to the singer), that the song does not appear to be in different *Râgas*, but in one and the same tune, and in the same *thât*. The author (at Vol. 1, ch. x, pp. 86—87) has related, that on account of the abovementioned variations and freedom, in *Thunri* songs, there is great scope in it for entertaining, and *Thunri* singers, both male and female, though not so well trained and skilled as *Ustâds* of *Dhrupad* and *Kheyâl* songs, do often entertain a unsophisticated audience, better than the latter. The author has also said, that on account of the unorthodox method of blending of different *Râgas* even in one section, and of singing these *Râgas* in unorthodox *thâts*, *Thunri* songs and *Thunri* singers are not only not liked, but they are often despised by *Ustâds*. But, the author is of opinion, that there is high scope of improvement of *Thunri* songs by evolution, on account of the abovementioned freedom in it. The author (at Vol. I, ch. xvii, pp. 220 &c.) has exemplified, and analytically shown, the abovementioned peculiarities of blending of *Râgas* and transitions, in *Thunri* songs.

Gulnaks, Gazl. A class of *Kheyâl* songs, in Persian or Urdu language, and in *Tâl Ektâlâ* only, in which the word *Gul* (flower) predominates, is called *Gulnaks*, *e.g.* the *Kheyâl* song, *gul gul khândâ*. *Gazl* is an Arabian word, meaning love poems. *Gazls* are Mahommedan folk songs of *Tappâ* type, and in *Tâl Postâ* only. They have been imported from Persia, and incorporated in Hindustani music. When composed in Persian and Urdu, they are called *Gazl*, but when composed in other languages of India, they are simply called *Tappâ*. *Gazl* poems are generally long, and on this account contain two, three, and even four *Kalis* (sections). The *Tappâ* song *gar yâr na ho*, is an example of *Gazl*.

Rekta (*Rektâ*, an Arabian word meaning poem, or song), and *Rubai* types of songs in Persian and Urdu languages, are exactly like *Gazls* in tune, the only difference being, that the poetical compositions of these songs are different from that of *Gazl*.

Sargam. (सारगम्). Singing a *Râga*, both in *Tâl* and tune, by *Solfa-ing*, is called *Sârgam*. Compositions in (*solfa*) notation, without either the words of a song, or syllables of *telânâ*, meant for singing by *solfa-ing*, are also called *sârgam*. Some portions of a song may be, and are now and then sung, in *sârgam i.e*, by *sol-faing* instead of with the words of the song. In India, the general practice in *Sârgam* is, to utter both the *suddha* and *vikrita* forms of notes, by their *suddha sol-fa* syllable names, *sa*, *ri*, *ga*, *ma*, *pa*, *dha*, *ni*. In actual singing, however, the *suddha* (*i. e.* natural) and *vikrita* (*i. e.* sharp or flat) notes are sung differently, in their proper pitches. The special *solfa* signs for, and pronunciations of, *vikrita* notes given in G. S. S., are innovations introduced by the author (of G S. S.).

Telana. *Telânâ* (तेलाना) or *Telenâ* (तेलेना) is vocal music sung by, or portions of a song, sung by, such syllables as *nâ*, *der*, *dâni*, *dim*, *tânâ*, *tom*, *telenâ*, *âlâliâ*, *loom &c.* Some words in some phrases of a song, may also be replaced by singing with *Telânâ* syllables. The author (at Vol. I, Ch. X, p. p. 84—85) says, that the practice of *Telânâ* singing has come to vogue in Hindustan, due to dirth of good compositions (with words) of *Ustâdi* songs, fit for *Dhrupads* and *Kheyâls*. By tracing its source, it can now be found, that *Telânâ* originated from *Tenaka* (तेनक) of ancient Indian music, which was sung by repeating the syllable *tena* (S. R. IV, 260 and commt.). S. R. says that *tena* was derived from the word *tat* (तत्), which word, in such phrases as *om tat sat*, *tattvamasi* (ॐ तत् सत्, तत्त्वमसि) indicates *Brahman* (ब्रह्मन्) or the Supreme Being, and thus the word *tena*, in *tenaka*, expressed and indicated (in ancient

Indian Music), welfare and blessing (S. R. IV, 12—13, 17—18). Hindusthani *telânâ* is exemplified in the practical examples of music of this volume.

Trivat (त्रिवट्) is a vocal music in three *kalis* (sections), one of which contains the words of a song, another, *telânâ* syllables, and the other, the *bols* of drums, such as *dhâ-dhâ tere-kete* &c., all of which are sung in *Tâl*, and also in tune of a *Râga*, As it contains these three sections, it is called *trivat* (sanskrit *tri*=three), and *trivats* are generally sung in *kheyâl* type. Song *ghari pala chhana*, is an example of *Trivat*.

Chaturanga (चतुरङ्ग) is also vocal music, containing, in addition to the three *kalis* of *trivat* mentioned above, a fourth *kali*, in *sârgam*. *Chaturanga* is also generally sung in *kheyâl* type.

Ragamala (रागमाला), In *Râgamâlâ*, a single song is sung in different *Râgâs* in its different *kalis* (sections). This can take place in all types of music, such as *dhrupad*, *kheyâl* or *tappâ*.

Talpher (तालफेर). A vocal or instrumental music, in which different sections are performed in different *Tâls*, is called in Bengal, *Tâlpher*.

Pravandha (प्रबन्ध). A song, which is sung in different *Tâls* in different *kalis* (sections) is called by Hindustani ustads, *pravandha*, This is only largely used in *dhrupad* types of songs. The author could not ascertain why the above, was called *pravandha* (G. S. S. Vol. I, Ch. X, p. 84). It is now apparent that the above *pravandha*, is only one of the various classes and types of ancient *pravandhas*.

Ancient Pravandha. A human composition (S. R, IV, 3-6) of music, bound by rules for the number or *Dhâtus* (धातु) or sections * that it is was to include, and also by the rules for the particular number, nature and form of its *angas* (अङ्ग) *i.e.*, component parts, mentioned below, was termed in ancient Indian Music, *pravandha* (S. R. IV, 5—6). A *pravandha* had two or more of the following

* Unlike modern Hindustani, *sthâyi*, *antarâ*, *sanchâri*, *âbhog* divisions into sections, mentioned before, the sections of ancient *pravandhas*, which were collectively called *dhâtu* (धातु) were:—(1) *Udgrâha* (उद्ग्राह) *i.e.* the preliminary or introductory *dhâtu* (section) (2) *Melâpaka* (मेलापक), which word indicated joining, so called because, this section, united *udgrâha* with the next section, (3) *Dhruva* (ध्रुव), meaning certain, so called because this section was to exist in every *pravandha*, (4) *Abhog* (आभोग), or final section, the dictionary meaning of sanskrit word *âbhog* being *paripurnatâ* (परिपूर्णता) *i. e.* completion (S. R. IV, 7—8, and commt.). In some varieties of *pravandha* there was a *dhâtu* (section) named *antarâ* appearing between *dhruva* and *âbhog*. (S. R. IV, 9), and in the examples in S. R., in which this *antarâ dhâtu* is mentioned, there is no *melâpaka dhâtu* (section). A *pravandha* might be of two sections, *udgrâha* and *dhruva*; or having *âbhog* with these two, of three sections; or with *melâpaka* and these three, of four sections. In cases of *antarâ* also, there were not more than four sections, as *antarâ* and *melâpaka*, did not exist simlutaneously. The theory of application of this *antarâ*, like most other ancient theories dealt with in S. R., are distributed over several hundreds of verses in S. R., and unless the classifications and varieties within classes, and their theories, as given in S. R., be properly grasped, it will be very difficult to form an idea of these subjects, and the statements in S. R. will seem to be contradictory at places. I give below the theory of ancient *antarâ dhâtu* as given in S. R., with a view to give an idea of the treatment of subjects in S. R., as well as for the propose of comparing the applications of ancient *antarâ dhâtu* with modern Hindustani *antarâ kali* (section) which has already been spoken of (at p. 64.)

Amongst many main classifications of *pravandhas* in S. R., they are divided into the three following principal classes, (1) *Suda* (सूड), (2) *Alisansrayâ* (आलिसंश्रया), and (3) *Viprakirnâ* (विप्रकीर्णा), (S. R. IV, 22). The *Suda* class is divided into two sub-classes, *suddha-Suda*, and *sâlaga-Suda* (शुद्धसूड, सालगभूड, S. R. IV, 312), each having several varieties (*ibid.* 23,315,) and the theories (लक्षण) of these varieties and their sub-varieties are given subsequently to their *uddesa* (उद्देश) *i. e.* indicated theories of classifications, (in S. R. IV, 33—180, and 315—360). *Sârangadeva* says that *antarâ dhâtu* (or section) is seen to exist, in *sâlagasuda* class of Rupakas (*rupaka*, रूपक as mentioned here, is another name of *pravandha*, S. R. IV, 6) only (S. R. IV, 9, and examples of these varieties are given in S. R. IV, 333 &c). But *Panchatâleswara* (पञ्चतालेश्वर) *pravandha*, which is a variety of *âlisansrayâ* class (S. R. IV, 24—27, at 26) is said in its theory (in S. R. IV, 254—261) to contain *antarâ dhâtu (ibid.* 260). *Kallinâtha* explains this apparent anomaly in S. R. by saying in his commentary, that the word *antarah* (अन्तरः) at that place in S. R. (*ibid.* IV, 260), means either the next section, or it means *antarâ dhâtu*, and if the latter interpretation be accepted, *Kallinâtha* continues, in spite of the rule to the contrary *viz.*, "*antarâ dhâtu* is seen amongst *sâlagasuda* class only, (S. R. IV. 9)" mentioned above, the existence of *antarâ dhatu* should be accepted from the evidence of actual text (S. R. IV, 261 commt.) In commentary to above rule, in S. R. IV, 9, commt., *Kallinâtha* says, that *Sârangadeva*, means by that rule, that *antarâ dhâtu* is seen to exist in practice, amongst *pravandhas* of the *sâlagasuda* class only, and *Sârangadeva*, in the opinion of *Kallinâtha*, means thereby, that that rule should be followed in practice, in spite of existence of text-book rules to the contrary. As regards rules and theories given in S. R., it should be understood that in S. R. is given, as *Sârangadeva* says, in condensed from, the pith as it were, from the voluminious writings of many ancient authorities on music named by him, and others not so named (S. R. I, 1, 15—20). In the text, *Sârangadeva* has named at places, some of these ancient authorities, at other places, he has simply said "others say" and in many places without

six *angas* (S. R, IV 19—20), and a *pravandha* might or might not be in *Tâl* or any rhythm (*ibid*, 21). Each *dhâtu* or section might be formed by different *angas*, or one sort of *anga* might be repeated in different *dhâtus* (sections), or seperate *dhâtus* of a *pravandha* might be formed of separate *angas*. The six *angas* of *pravandhas*, as detailed in S. R. IV, 12-18, were :--

(1) *Swara* (स्वर), which were similiar to modern *sârgam*.

(2) *Biruda* (बिरुद)—these were *bols*, of *kâhalâ* (काहला) * type of instruments, abounding with syllables *hâ hu* (हा हू) &c. (S. R, VI, 792—793), resembling human exclamations (*ibid*. and S, R. IV, 200 and commt.).

(3) *Pada* (पद) *i.e.* musical compositions with words, whether in prose (*e.g.* as mentioned in S. R. IV, 250) or in poetry.

(4) *Tenaka*, which has already been explained,

(5) *Pâtah* (पाटः) *i. e.* ancient *bols*, composed with syllables formed by special consonants, for special ancient *avanaddha vâdyas*, or drumming instruments, and for special *ghana-vâdyas*, or solid instruments *i.e.* those played by striking of solid parts.†

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giving such references, he has embodied their writings in his text. *Sârangadeva* has also given in his book, his own opinions and observations from actual practice, as well as, the opinions of contemporary authors, and has also mentioned contemporary practice. Unless all these are differentiated, S. R. will appear to be anomalous at places.

The abovementioned word *sâlaga* in *sâlagasuda*, says *Kallinâtha*, is a corruption of the word *chhâyâlaga* (छायालग), which means, containing shades of, or resembling, *suddha* or pure forms (see S. R. IV, 312 and commt.). Modern Hindustani *Râgas* are also popularly divided into the three *jâtis* (जाति) or classes,—(1) *Suddha i.e.* pure or unmixed, (2) *Sâlanka* (सालङ्क) or a *Râga* formed by mixture of two pure *Râgas*, (3) *Sankirna* (संकीर्ण), or containing mixture of three or more *Râgas* (G. S. S. I., viii, 53.) This modern word *sâlanka* is derived most probably from the ancient word *sâlaga*, the corruption of *chhâyâlaga*.

*These were metallic wind instruments, with wide ends, and played by the mouth at the narrow end, similiar to trumpets, but *Kâhalâs* were straight, about three cubits long, having no keys or holes on its surface, for playing notes by stopping with fingers (S. R. VI, 792—793). Similiar instruments called *Kâhala* (काहल) are met with amongst musical instruments of temples of Orissa and these in curved form, called *singâ* (शिङ्गा) *i.e.* horn, resembling buffalo horns in shape, are seen now and then, accompanying street *kirtana* song parties of Bengal. These *Kâhalas* and metallic *singâs* are, however, nowadays only played occasionally, at the whim of their players, without any reference to the rhyme, or tune of the music, which they accompany.

† I have already spoken of some ancient systems detailed in S. R. &c. *Pâtahs* are detailed in Ch. VI, of S. R. Some of the ancient methods, and technical terms mentioned there, and in other parts of S. R., are met with now and then, in books of Sanskrit literature, but these have not properly been understood, even after the printing and publication of S. R., as Sangita Ratnakar appears to be abstruse at places, to a modern reader. With a view to help interested readers in seeking from S. R. similiar ancient musical terms, that they may find in other Sanskrit books, including those on general literature, and also with a view to explain some technical terms and systems, which are widely used and referred to in the above, and other chapters of S. R., the meanings of which can only be had on reference to a wide range of that book, the following description of some of these ancient systems is given below.

There were four varieties of *vâdyas* (वाद्य) or musical instruments (S. R. VI, 3—6),—(1) *tata* (तत) *vâdya* or stringed instruments *i.e.* different varieties of ancient *vînâs*, (2) *sushira* (सुषिर) *vâdya*, *i.e.* instruments with holes, or perforated instruments, such as *vansa*, *kâhala*, *sringa* (शृङ्ग) or horns of buffaloes, *sankha* (शङ्ख) *i.e.* shell of that name, &c., (3) *avanaddha* (अवनद्ध) *vâdya*, or those, whose ends were bound with leather *i.e.* various ancient drumming instruments, such as *pataha*, *mardala* (which was also called *muraja* (मुरज), and *mridanga* (मृदङ्ग), S. R. VI, 1024), *dhakkâ*, *karatâ*, *dundubhi*, *veri* (पटह, मर्दल, ढक्का, करटा, दुन्दुभि, भेरी) &c., which were played by hand, or *kona* कोण *i.e.* stick, or by both. *Danda* (दण्ड) and *kudupa* (कुडुप) were also the names of these *konas* (S. R. VI. 914), which were sticks (with handles formed, of cloth and wax, for purpose of playing drumming instruments, S. R. VI, 822), two for both hands, or only one stick for one hand, (4) *ghana* (घन) *vâdya*, or sold instruments, such as *tâla* (ताल), or small cup shaped cymbals, similiar to modern *mandirâs* (मन्दिरा), *kânsyatâla* (कांस्यताल) or larger, and flatter shaped, cymbals, similiar to modern *karatâl* (करताल), *ghantâ* (घन्टा) or bells, *kshudraghuntikâ* (क्षुद्र घुंटिका), which was also called *ghargharikâ* or *gharghara* (घर्घरिका, घर्घरा), or little bells, tied to a string, *i.e.* modern *ghungur* (घुङ्गुर), &c. In S. R. Ch. VI, is detailed the size, structure, materials, and use of these various ancient instruments, and also of varieties of some of these instruments. S. R. Ch. VI also gives the *pâtâh* (पाटाः), or *hastapâtâh* (हस्तपाटाः), or *talapâtâh* (तलपाटाः S. R. VI, 820, 825, 836) *i. e. bols* in syllables formed by combinations of especial consonants for especial drumming instruments,, as well as various compositions with *bols*, bearing sepecial ancient names *e. g. Jati*, *Otâ*, *Gajara*, *Rigoni*, *Upasama*, (यति, ओता, गजर, रिगोनी, उपशम) &c. These *Jati*, *Otâ* &c., meant for drumming, were called *Vâdyapravandhas* (वाद्यप्रबन्धाः), and they are detailed in S. R. VI, 943—1016. *Pâtâhs i.e.* especial *bols* with syllables composed with especial consonants for various *ghana vâdyas*, *i.e.* for cymbals, &c. are also given in S. R. Ch. VI.

(6) *Tâla, i.e.* one or other of the various ancient *mârga* or *desi Tâl*s (S. R. IV., 18). These ancient *Tâls** are detailed in Ch. V. of S. R.

A *pravandha* had, as already said, two or more of these six *angas*. *Pravandhas* varied by having different numbers of *angas*, and also having the same number of the same *angas*, they varied by having different forms and types of these *angas*. In S. R., Ch. IV, called *pravandha-adhyâya* is detailed the theory of various classifications, and numerous types and varieties within classes, of ancient *pravandhas*. A modern *Râga*, and the abovementioned *Trivat*, *Chaturanga*, *Râgamâlâ*, *Tâlpher*, *Telânâ*, *Pravandha* &c., all come within the definition of ancient *pravandha*.

*__Ancient Talas.__ In S. R. Ch. V is detailed various ancient *mârga* (*i.e.* of celestial origin, or classical) and *desi* (*i.e.* mundane or provincial) *Tâls* with descriptions of their rhythms, illustrated by signs, for *laghu*, *guru*, and *pluta* (लघु, गुरु, प्लुत) *i. e.* short, long, and very long, time-units, respectively, in case of *mârga Tâls*, and an additional *druta* (द्रुत) *i.e.* very short time unit in case of *desi Tâls*, (S. R., V. 16, 236. and commts). The time taken for uttering five *laghu aksharas i.e.* five short vowelled syllables, such as *ka cha ta ta pa* (कचटतप) was said to be the measure of one *mâtrâ* of *mârga Tâls* (S.R., V. 16 and commt.) but for *desi Tâls* this time measure might be a little more, or less, to suit particular music, *e.g.* time required for uttering four, or six *laghu aksharas* might be the measure of one *mâtrâ* for some *desi* music in *desi Tâls* (*ibid.* V., 16, 235—236, 261, and commts). Thus, similar to that of modern Indian Music, there were no scientific measurements for time-units, but simply rough time-measures, for *Tâls*, of ancient Indian Music. With the above time-values of *mâtrâs*, there were the following fixed proportions for *laghu guru*, &c., in both *mârga* and *desi Tâls*. *Laghu* was one *mâtra*; *guru* was twice *laghu*; *pluta* was thrice *laghu*, and *druta* was half of *laghu*; *i.e. druta* was half *mâtrâ*, and *guru* was of two *mâtrâs*, and *pluta* was of three *mâtrâs*. Besides this ordinary meaning of *mâtrâ* which was the same as that of Modern Indian Music, the word *mâtrâ* was used in some particular senses for particular purposes, *e. g.* different hand movements (already mentioned by me at p. 36) for beating the time of *mâtrâs*, were also called *mâtrâs* (*ibid.* V, 12), and the word *mâtrâ* also signified a subordinate part in the rhythm of a piece of ancient Indian Music, consisting generally of a complete unit of a *Tâl* (S. R., V, 21, and commts., S. R., V, 80—84 illustrations). Amongst different ancient systems of classifications, of *Mârga-Tâls* (mentioned in S. R., V, 17, 43—46), the main classification of *Mârga-Tâls*, as adopted by *Sârangadeva*, were principally two: (1) *Chachchatputah* (चच्चत्पुटः), which were *chaturasrah* (चतुरस्रः), *i. e.* having four, or multiples of four, units, and (2) *Chachaputah* (चाचपुटः), which were *tryasrah* (त्र्यस्रः), *i. e.* consisting of three, or multiples of three units. But unlike the number of units counted within a *pada* (each *pada* is shown as a bar in practical examples in G. S. S., as already spoken of by me at pp. 37—38, 54) of Modern Indian Music, the above-mentioned units, for these ancient tripple, or quardruple classes of *mârga Tâlas*, were the *pâdas*, (पाद) themselves. Excepting in the prototype *Jathâksharah* varieties, mentioned below, in other varieties of independent *mârga Tâls*, all *pâdas* were of equal length, and each *pâda* consisted of 2, 4, 8, or other multiples of two *mâtrâs*, but not uneven *mâtrâs*. This was not so, in the case of *desi Tâls*, and also in *mârga Tâls* and rhythms, formed by combinations of independent *mârga Tâls*, or in *khanda* varieties of these independent *mârga Tâls*. In these cases unequal *pâdas*, *i. e. pâdas* of different time-lengths, within a unit of a *Tâla*, or rhythm, were possible. I have already said, that the main division of *chachchatputah* and *châchaputah* classes of *mârga Tâls*, was that adopted by *Sârangadeva*, out of many other ancient systems of classification detailed in S. R. V. 43—46. These other systems, recognised *Tâls* having unequal *pâdas* by *khanda* process (*ibid.* 45), and also *Tâls* having 7, 9, 11, &c. *pâdas* (*ibid.* 44). According to some of these ancient versions of classification, *desi-Tâls* might also be said to be formed by combinations of, or by *khanda* subdivision of, independent *mârga Tâls* (*ibid.* 45, 46). These ancient *pâda* subdivisions were similiar to modern *pada* subdivisions within an *âvarta* (called *âvritti* in ancient music, S. R., V., 47; I, vii, 63 65 commt.).

Khanda (खण्ड) process consisted in varieties being formed of a single *Tâl*, by subdividing *pluta* &c. of that *Tâl* into shorter time-units of *guru*. &c., and again subdividing these *gurus* &c. into *laghus* &c. *Sârangadeva* has described the process by which several varieties of a single *Tâl* might be formed by different combinations of the abovementioned subdivisions of *pluta*, *guru*, &c of the *Tâl*, up to their minutest subdivisions into *druta* (S. R., V, 314-316, and commt.), and he has also explained by ancient methods of mathematical calculations, how thousands of varieties of the original independent *Tâls* might be formed by that process (S. R., V, 317—405). From these calculations it should not be inferred that all these thousands of varieties of *Tâls* actually existed in practical music. These calculations, and similar calculations, in S. R. I, iv, 32—70, and in R. V. I, 44—54 and commts., for hundreds of thousands of varieties of *Kuta-Tânas* (कूट-तान, *i. e.* performances of combinations of 7, 6, 5, 4, or less numbers of *swaras* (tones) not in regular sequence, but in irregular order, S. R. I, iv, 32), all these ancient calculations, include, *nashta* (नष्ट), *uddishta* (उद्दिष्ट), *khanda-meru* (खण्ड मेरु) &c., calculations, which were ancient processes of mathematical calculations, similar to calculations for permutation and combination of modern algebra, and each ancient author, with a view to help his readers explained in his own way, these ancient methods of calculation. From these calculated numbers, and similarly from the calculations for 392 different combinations of seven notes in regular order, called *kramas* (क्रम), in S. R. I, iv, 19—20, and of 153 *vikritis i.e.* changes from the *suddhâ* forms, of the seven independent *vikritâ-jâtis* (as distinguished from the eleven mixed *vikritâ-jâtis* mentioned in S. R. I, vii, 8—16), calculated in S. R. I, vii, 3—7 and commt., and the calculations for hundreds of *Mela* (मेल, then popularly called also *thâta* (थाट R. V. III, 1 commt), which were, ancient generic *thâts*) in R. V., III, 8—25 and

The author of Gita-Sutra-Sar, has explained the nature of other forms of Hindustani Music, such as *Jugalbandi*, *Tapkheyâl*, &c., in Ch. X of G. S. S., Vol. I, but as these have not been practically exemplified by music, in this Vol. II of his book, I have not repeated their description here.

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commts., it should not be inferred that all these varieties actually existed in contemporary, or more ancient, practical music. These calculations were merely for ascertaining the theoretically possible varieties. Thus, *Somanâtha* has used only 23 *Melas* (*i.e.* generic *thâts*) for purpose of *Râgas* in his book (R, V., III, 25—26). Similarly from the general rules of *Suddhâ-Jâtis* (as given in S. R., I, vii, 1—2) and from the general rules for both *suddhâ* and *vikritâ* (including primary and mixed *vikritâ*) *Jâtis* (given in *ibid.* 17—29, 34—46, 52—53, 58—60), and the general rules for the seven primary *vikritâ-Jâtis* (as mentioned in *ibid.* 3), and the special rules for the seven primary *vikritâ-Jâtis* given simultaneously (see S. R. I, vii, 79 commt. near conclusion) with the special rules for the seven *suddhâ-Jâtis* (in S. R., I, vii, 61—79) and from the rules for the eleven mixed *vikritâ-Jâtis* (given in *ibid.* 9—16, 80—108), it will be seen that only some, but not all the abovementioned 153 *vikritis* *i.e.* departures from *suddhâ* forms, have been included in the *vikritâ-Jâtis*. In this way, although *Sârangadeva* has given calculations for hundreds of varieties of *desi Tâls* (in S. R., V, 311—405) he has named, and given the theory of the rhythms of, only 120 *desi-Tâls* (*ibid.* 252) in S. R., V, 237—309, out of numerous *desi-Tâls* (*ibid.* 237, 252 commt.) leaving out others, as unimportant (*ibid.* 310). Some of these *desi Tâls* had varieties, each having a distinct name. Thus, ten varieties of *Manthaka* (मण्ठक) *Tâl* are mentioned in S. R., V, 276 (of which the rhythm of four varieties are detailed in S. R., V, 276, and of the other six varieties, in S. R., IV, 335—338). Of these, the metre of one variety, named *Mangala* (*Manthaka*) *Tâl*, as mentioned in S. R., IV, 337 is *bha-gana* (भगण) *i.e.* — ⏑ ⏑ (*ibid.* IV, 57). Many of the abovementioned 120 *desi Tâls* shown in S. R. as distinct *Tâls* with distinct names would be considered as one and the same *Tâl* in modern music. Thus *Pratitâla* (S. R., V, 244. N. B. here in the printed book, the reading '*Pratipâlakah*' is incorrect), with metre ⏑ OO (*ibid. 281*, sign O means *druta*) would be considered, in modern music, the same *Tâl*, as the above-mentioned *Mangala* variety of *Manthaka*. Similarly *Aditâla* (आदिताल) which was also called *Râsatâla* (रासताल) with metre ⏑ (one *laghu*, *ibid.* 260), and *Ekatâli* (एकतालौ) *Tâl*, with metre, O (*i. e.* one *druta*, *ibid.* 289) would not be considered distinct *Tâls* in modern music. Similarly *Kudukka* (कुड्क्क) *Tâl*, with metre O O ⏑ ⏑ (*ibid.* 273), would now be considered the same *Tâl*, as ancient *Trivangik* (त्रिभङ्गिः), having ⏑ ⏑ — — as its metre (*ibid.* 275). In modern Indian Music, all these would be considered the same *Tâls*, varying in speed only. In this way, the four varieties of ancient *Kankâla* (कङ्काल) *Tâl*, each having a distinct name, with metres O O O O — ⏑ ; O O — — ; — — ⏑ ; ⏑ — — (*ibid.* 287—288) would be considered in modern Indian Music, as different *parans* (*i.e.* variations in rhythm) of one and the same *Tâl*, of five *mâtrâs*. Besides these *druta*, *laghu*, *guru*, and *pluta* time-units, some *desi-Tâls*, had one or more *virâmas* (विराम), or *visrântis* (विश्रान्ति) *i.e.* rests, embodied in their metres. The time-values of these rests have been explained (in S. R., V, 260—261 commt.) by the commentator *Kallinâtha*. In the above illustrations, I have shown *guru*, *laghu*, and *druta* by —, ⏑, and O signs respectively. In S.R., the metres of both *mârga* and *desi Tâls* have been illustrated by signs, and in the printed book especial signs have been used for this purpose. According to ancient systems, as mentioned by *Sârangadeva*, for illustrations of rhythms, the sign for *laghu*, was one *riju* (ऋजु *i.e.* upright line *i.e.* sign I), that for *guru*, was one *vakra* (वक्र *i. e.* crooked) or curved line (S. R., IV, 54—55), and for *Tâls*, besides the above signs, *pluta* was represented by a line with three curves, and *druta*, by a small circle (S. R., V, 255—257 and commt.) Besides these, a special sign was attached to the above signs, to indicate the abovementioned *virâma*, or rest, that was incorporated within the metre of *desi-Tâls* (*ibid.* 258). I shall now speak of *mârga-Tâls*, which as already said, according to some authorities, were the parents of all other *Tâls*.

Marga Tals. The primary *mârgâ-Tâls* in accordance with the classification adopted by *Sârangadeva*, as already said, were *chachchatputah* and *châchaputah*. Due to its subdivision into even units *chachchatputah Tâl* was called *Jugma* (युग्म, S. R. I, viii, 21, commt., V, 43), and also *Jugmaka* (युग्मक, *ibid.* V, 32). Similarly for being uneven, *châchaputah* was also termed *Ojah* (ओजः), [*ibid.* V, 37, and commt.]. As already said, the even and uneven natures of the above *Tâls* signified, that these had even or uneven numbers of *pâdas*. *Shatpitâputrakah* (षट्पितापुत्रकः), which was also termed *Uttarah*, and *Panchapânih* (उत्तरः, पञ्चपाणिः, S. R., V, 22—23) *Tâl*, and another *Tâl* named *Udghattah* (उद्घट्टः) *Tâl*, were varieties of the *châchaputah* class (*ibid*).

Every *Mârga Tâl* mentioned above, had three varieties in each. These varieties were :—(1) *Jathâksharah*, also called *Ekakalah*, (2) *Dwikalah*, (3) *Chatushkalah*. The word *Jathâksharah* (यथाक्षरः) literally means exactly as the letters, and the rhythms of the *Jathâksharah* varieties of the abovementioned, and similar other *Tâls*, were the same as that formed by the scansion of the *laghu*, *guru*, and *pluta* syllables of the names of these *Tâls*, as indicated by general rules for *laghu* and *guru* of sanskrit metres, and especial rules for *pluta* for particular *Tâls*. Sarangadeva has given the rules for *laghu* and *guru* syllables of sanskrit metres in S. R., IV, 53—54. These rules are similar to those already mentioned by me (at pp. 47—48). Special rules for *laghu* and *guru* syllables of the *Prâkrita* language, for purpose of metres, have also been given by *Sârangadeva* (in *ibid.*, IV, 55—56). The rhythms of the *Jathâksharah* varieties of the abovementioned *Tâls* which were indicated by the abovementioned

Raga (**राग**). I have freely used the word *Râga*, and most of the music of this book, are in one or other *Râga*. This classification of *Râga* is a peculiarity of Indian Music. Like that done in S. R., R. V. &c.,

rules for *laghu* and *guru* of sanskrit metres, and by the special rule of the last syllable of *chachchatputah* being *pluta* (S. R., V., 18) and of the first and last syllables of *Shatpitâputrakah* being *pluta* (*ibid.* 22), were as follows:—

Jathâkshara Chachchatputah (**यथाचर-चच्चत्पुटः**) *g g l p* (S. R., V. 18).

„ —*Châchaputah* (**यथाचर-चाचपुटः**), *g l l g* (*ibid.*).

„ —*Shatpitâputrakah*, ... *p l g g l p* (S. R., V. 22).

„ —*Udghattah*, ... *g g g* (*ibid.* 23).

The *pluta*, *guru*, and *laghu* time-units, have been shown above, by signs *p*, *g*, and *l*, respectively. In the printed S. R., besides the ancient sign | *i.e.* an upright line, for *laghu*, especial signs have been used for *pluta* and *guru* in the illustrations. (N. B. there are errors in the printed S. R. in the illustrations by signs of some of the abovementioned *Tâls*, and of other *Tâls* and rhythms also, in S. R., Ch. V.) These typical rhythms of the *Jathâksharah* variety, exactly as indicated by the syllables, were in use only in some forms of very ancient music, *e.g.* typical *Jathâkshara-Panchapânih* (*i.e. Shatpitâputrakah*) rhythm was included in the rhythms of the different varieties of *Madraka* (**मद्रक**), *Aparântaka* (**अपरान्तक**) and other forms of very ancient vocal music (See S. R., V, 79 84, 93—108, &c.), which were collectively called fourteen *gitâni* (S. R., V, 59). Except in these rare instances, in very ancient forms of music, the typical *Jathâksharah* rhythm of the *Jathâksharah* variety, were not indicated by that variety of *Tâls*, but, for practical purposes, the *Jathâksharah* variety, generally indicated the total *mâtrâs*, in each *Tâl* of that variety. Thus, *Jathâkshara-Panchapânih* (*i.e. Shatpitâputrakah*) indicated, for practical purposes, 12 *mâtrâs*, divided into six *pâdas* (**पाद**) of one *guru*, or of two *laghus*, each. This will be found exemplified in the variations of *Tâl Panchapânih*, illustrated in *Sâdji—Jâti*, in S. R. I, vii, 61—65, and in et. seq.. The *Jathâksharah* variety was also called, *Ekakalah* (**एककलः**) variety, and in this connection *Sârangadeva* says, that a *kalâ* was one *guru* (S. R., V, 19). In that connection, *Sârangadeva* also says, *Dwikalah-chachchatputah* had 8 *kalâs*, *Dwikalah châchaputah* had 6 *kalâs* (*ibid.*), *Dwikalah-shatpitâputrakah* had 12 *kalâs* (*ibid.* 23), and the *kalâs* of the *chatushkalah* variety of each of these *Tâls*, were twice that of the *Dwikalah* variety (*ibid.* 20, 23), and there were two *kalâs* in each *pâda* of the *Dwikalah* variety, and four *kalâs* in each *pâda* of the *chatushkalah* variety (*ibid.* 20—21). Each *kalâ*, of these *Dwikalah*, and *Chatushkalah* varieties, was of one *guru* (or its equivalent, two *laghu mâtrâs*). *Sampakkeshtâkah* (**संपक्केष्टाकः**) *Tâl* was another *mârga Tâl*, derived from *shatpitâputrakah* (*ibid.* 24). The metre of the *Jathâksharah* (or *Ekakalah*) variety of *Samvakkeshtâkah Tâl*, according to general rules of *laghu* and *guru* syllables, and the especial rule of its initial and final syllables being *pluta* (*ibid.* 24), was *p g g g p* (*ibid.* 24 25.) Some other varieties also, of the above *mârga Tâls*, are detailed in S. R., V, 26.

The metres of the *Dwikalah* (**द्विकलः**) and *Chatushkalah* (**चतुष्कलः**) varieties of the abovementioned *Tâls*, (as illustrated by *Sârangadeva*) are shown below :—

Dwikala-Chachchatputah -- — — — — -- —

„ —*Châchaputah* — — —

„ —*Shatpitâputrakah* — — — — — — — - — - —

Chatushkala Chachchatputah — — - — — — - — — — - — — — — — ; *Chatushkala—Châchaputah* — — — — — — - — - — — — ; *Chatushkala—Shatpitâputrakah* — — — - — — — — — — — — — — — — — — — — — - — - -. The metres of *Dwikalah* and *Chatushkalah* varieties of *Udghattah*, and *Sampakkeshtâkah Tâls*, were exactly as of these two varieties, of the original *Tâls*, from which they were derived, viz. of *Châchaputah* and *Shatpitâputrakah* respectively (*ibid* 25). In the above illustrations, similar to that done for illustrations of metres (at p. 48 &c.), the sign — has been used by me for *guru i.e.* for a two-*mâtrâ* unit.

Kala (**कला**). The time-unit, in the above cases, was a *kalâ*, and its value as already said, in these instances was one *guru*. *Kalâ* (**कला**), lit. meaning a part, parcel, or a sub-division, meant for purposes of *Tâls* and other rhythms, a unit measure of time (S. R. I, vii, 65 commt.) The subdivisional part taken as this unit, and its time-value, was different in different cases. Thus, in the above varieties of *Tâls*, a *Kalâ* was a subdivision of a *pâda*, and its value, as already said, was one *guru* (*i.e.* two *mâtrâs*). The four varieties of silent, and four varieties of sonorous (*i.e.* producing sound) hand-movements, already spoken of (at p. 36) were collectively called *Kalâ* (S. R., V, 4 and 6). These hand-movements were generally intended for beating the *Kalâs* (*i.e. Kalâ* subdivisions) of *mârga Tâls*, and other *mârga* rhythms. For purpose of metres, of *Mâtrailâ* varieties of *pravandhas*, which were measured by *mâtrâs* (S. R., IV, 94) each *Kalâ*, was a subdivision of the (whole) metre, (that was fixed for each of these varieties of *pravandhas*), and the value of a *Kalâ*, in these cases was one *laghu*, *i.e.* one *mâtrâ* (S. R., IV, 63). I may mention here that these *Mâtrailâs* (**मात्रैला**),

the author of G. S. S., has not classed *Râgas*, as *Râgas* and *Râginis*, but has termed all of them as *Râgas*.

detailed in S. R., IV, 94—105, were *mâtrâ* varieties, out of the four varieties of *Elâ* (एला) *pravandhas* classified by *Sârangadeva* (*in ibid.* 52). *Sârangadeva* has also named and classed, other varieties out of innumerable varieties (*ibid.* 131) of *Elâ*, in accordance with different versions (in *ibid.* 40-51, 129-131). This *Elâ* was a sub-class of *Suddha-Suda* (*ibid.* 312) class of *pravandhas* (*ibid.* 22—23). This *Suddha Suda* class of *pravandhas*, have already been spoken of (at p. 67). Besides these special values of *Kalâ* for special varieties, of (*mârga*) *Tâls*, and *pravandhas*, each *Kalâ* was equivalent to a *pâda* (the same as a bar of European music) in the four varieties of *mârgas*, detailed in S. R., V, 11—15, and a *Kalâ* was of one, two, four, and eight *mâtrâs* respectively, in these four varieties of *mârgas* (*ibid.* 11). These *mârgas*, detailed below, were ancient classifications for variations of *rhythm*. Another ancient system for variation of rhythm, was, by classes of *gitis*, detailed below. In these *gitis* each *Kalâ* was of 2, 4, and 8 *mâtrâs* (and also of 12 *mâtras*, if syncopated bars of *ardha-mâgadhi giti* be taken as one *kalâ*). Groups of notes, similar to those for *Tâls*, in other cases also, *e. g.* in the *Alankâras* (अलङ्कार) were called *Kalâ*, These ancient *Alankâras* were embellishments formed by particular combinations of particular notes, or formed by one, two, three or more groups of notes, each of these groups comprising one, two, three, or more notes, peculiarly juxtaposed with each other, in each variety of *Alankâra*. Each of these groups of notes in an *Alankâra*, whether consisting of one note, or of more notes, was called a *Kalâ* (S. R., I, vi, 11, 12, 23 &c.) Several varieties of ancient *Alankâras* are detailed in S. R., Ch. I. *prakaran* vi, and in R. V., I. 57—81, and in other ancient books, such as in *Sangita-Pârijâta* &c. Each of these authors, differs, however, in detail, about the names, descriptions, constituent parts, &c. of different *Alankâras*, and also about the total numbers of *Alankâras*.

Marga (मार्ग). *Mârga* as already said, was an ancient system of classifying variations of rhythm, including those of *Tâls*. Ancient music recognisd four *Mârgas* (मार्ग) *i. e.* ways of performing rhythms. These were (1) *Dhruva* (ध्रुवः), (2) *Chitra* (चित्रः), (3) *Vârtikah* (वार्तिकः) or *Vritti* (वृत्ति), and (4) *Dakshina* (दक्षिणः) *mârgas*. In these *mârgas*, a *Kalâ* was of one, two, four, and eight *mâtrâs* respectively (S. R., V, 11). Each *Kalâ*, in these cases, was, as already said, equivalent to, a *pâda* of an ancient *Tâl*, or a bar of Modern European Music. The *mâtrâ* measures spoken of above, of *mârgas*, signified *laghu* time units (S. R. V., 16), and also special hand-movements, termed, as already said (at p. 36) *mâtrâs*, each having a name. These names were *Dhruvakâ*, *Sarpini* (ध्रुवका, सर्पिणी) &c. Two especial ones, out of these eight *mâtrâ* hand-movements, were especially allotted for beating the rhythm of *Chitra mârga*, four were especially allotted for *vârtika mârga*, and all these eight, for beating the rhythm of, *Dakshina mârga* (*i. e.* for timing the *mâtrâ* time-units of the *Kalâs*, in the cases of each of these *mârgas*). These are detailed in S. R., V, 11—15.

Giti (गीति), as already said, was an ancient system of classification of rhythm. *Giti* also included special formations of syllables, and variations in speed, as shown below. These *Giti* classifications were very ancient, and there were four varieties of *gitis*, or types of singing songs. They were *Mâgadhi*, *Ardha-Mâgadhi*, *Sambhâvita*, and *Prithulâ* (मागधी, अर्धमागधी, संभाविता, पृथुला) *gitis* (S, R., I, viii, 16). *Sârangadeva* has described two seperate versions of classification, for each variety of these *gitis*. These two classifications, according to the commentator *Kallinâtha*, were (1) *Padâsrita* (पदाश्रित) *i. e.* based principally on rules for *pada* (पद *i. e.* words, or phrases), and (2) *tâlâsrita* (तालाश्रित) *i. e.* based principally on *Tâla* (*ibid.* 20—21 commt.) The following is the 1st version (*i. e. padâsrita* classification) of these four *gitis* as detailed by *Sârangadeva*. In this version, in *Mâgadhi giti*, a *pada* (*i. e.* word, or phrase of a song) is sung in *vilambita laya* in the first *kalâ*, the same *pada* together with the next, is sung in *madhya laya* in the second *kalâ*, and both these *padas*, together with the third *pada*, is sung in *druta laya* in the third *kalâ* (*ibid.* 17—18). Ancient Indian Music recognised the abovementioned three varieties of *layas* only. They are detailed in S. R., V, 48. These were similar to *layas* of the same names of Modern Indian Music (already spoken of by me at p. 33). *Sârangadeva* has given two ancient versions of (the *padâsrita*) *Ardha-Mâgadhi giti*. According to this first version, each of the first two *padas* is followed by its final half (syllables), and in accordance with the above second version, each of the first two *padas* (is not used singly, but each) is once repeated in course singing, in (*padâsrita*) *Ardha-Mâgadhi giti* (S. R., I, viii, 19), as will be seen from the examples quoted below, (from S. R., I, viii, 18—19, illustrations), which include each of the above two versions.

Padâsrita class of :—

Mâgadhi Giti.

मा	गा	मा	धा	१
दे	०	वं	०	
धनि	धनि	सनि	धा	२
दे०	वं०	रु०	द्रं	
रिग	रिग	मग	रिसा	३
देवं	रुद्रं	वं०	दे०	

Ardha-Mâgadhi Giti.

1st Version.

मा	रो	गा	सा	१
दे	०	वं	०	
सा	सा	धा	नौ	२
वं	रु	द्रं	०	
पा	धा	पा	मा	३
द्रं	वं	दे	०	

2nd Version.

मा	मा	मा	मा	१
दे	०	तं	०.	
धा	सा	धा	नौ	२
दे	वं	रु	द्रं	
पा	निध	मा	मा	३
रु	द्रं०	वं	दे	

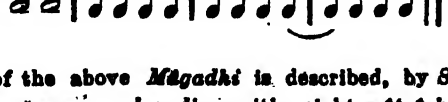
Though attempted, the word *Râga* has not been properly defined. Thus, *Râga* has been called a mode, mould, melody type, but none of these terms, correctly defines *Râga*, and correct definition of the word *Râga*

The reading of the 1st. *kalâ* in the above example of *Mâgadhi giti* as given in the printed S. R. I, viii, 17—18 illus., is incorrect. I have given above, its correct reading, from *s. c.* S. R. Cal. I, vii 16--17 illustration. The above are typical examples of music in notation, as illustrated in S. R., in which, in the generality of instances, single long vowelled notes, or groups of two (as in above) or three (*e.g.* in S. R. II, ii, 28—30 illustration) short vowelled notes represent one time-unit of *Tâl*, or of rhythm. In the above, and in examples of songs with notation, illustrated in S. R. generally, each *kalâ* is shown by a bar. In the above examples, according to commentator Kallinâtha each *kalâ* is of four (*laghu*) *mâtrâs* (S. R. I, viii, 17—18 commt.) and each time-unit of a *kalâ* is one *mâtra*. The three *kalâs* in the above example of *Mâgadhi giti* are, as already said, in the three varieties of *layas*, hence these three *Kalâs* are also illustrations of the three *layas*. The repetition of words, or sylables of words, as exemplified in the above illustrations of *Ardha-Mâgadhi* should not be found fault with, as, according to *Kallinâtha*, repetition of words, or of syllables of words, are sanctioned in the recitation of Vedas (*ibid. 19* commt).

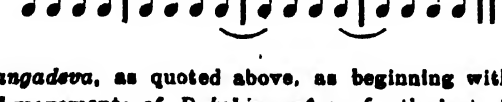
This (*padâsrita*) class of *Sambhâvitâ* and *Prithulâ gitis*, had, says *Sârangadeva*, small numbers of words in (the *kalâs* of), the former, while large numbers of words were included (in the *kalâs*) within the music of the latter, and *guru* (*i.e.* long vowelled) syllables abounded in the words of *Sambhâvitâ giti*, while *laghu* (*i. e.* short vowelled) syllables abounded in the words of *Prithulâ giti* (*ibid.* 20). *Sârangadeva* has illustrated both of them by examples. While detailing the theory of the other (*i. e. talâsrita*) version of the abovementioned four varieties of *gitis*, *Sârangadeva*, has given the theories of the first two, in terms of ancient technical names, which is difficult for a modern reader to comprehend. It can easily be assumed, that in using these technical terms, and technical language, *Sârangadeva* had followed more ancient texts. He has given the explanations of these technical terms in subsequent chapters. I shall give here, brief explanations of that technical language, and of these technical terms, and show thereby what these ancient *gitis* signified. *Sârangadeva* says, "According to another version" (by this he differentiates *padâsrita gitis* previously spoken of), "if after two *gurus* of *Jathâksharah Jugma*, *Cha-gana*" (the reading च-गुणात्मकम् here, in S. R. Poona, I, viii, 21, is incorrect, of which the correct reading is च-गणात्मकम्, as given in *ibid.* commt., and also in *s. c.* S. R. Cal. I, vii, 20) "is performed, to which, then, eight *mâtrâs* are added, and all these are timed, beginning with" (hand-movements of) "*Chitra-mârga* for each of the first two" (which are) "*gurus*, of *Jathâkshara Jugma*, and ending with the eight *mâtrâs* (hand-movements) called *Dhruvaka* &c., of *Dakshina-mârga*, then it is called *Mâgadhi giti*" (S. R. I, viii, 21--22). "When to the third" (which is) "*laghu*" (in the rhythm) "of" (*Jathâksharah*) "*Jugma*, half of *Chha-gana* is combined, and these are timed by the first two and the last two" (out) "of the" (eight varieties of) "*mâtras*" (*i. e.* hand-movements), "then adding one and a half of" (that *Chha-*) "*gana* to *pluta*" (*i. e.*) to three *mâtrâs*), "the latter are performed by timing them with the eight" (hand movements named) "*Dhruvaka* &c., and also with the last two" (of these eight) "performed twice" (comprising altogether twelve *mâtras* or hand movements), "then it is called *Ardha-Mâgadhi*" (*ibid.* 23 --25). *Jathâkshara-Jugma* (*i. e. Chachchatputah*) *Tâl*, has already been explained (at p. 71), and from its rhythm it will be found that the first two are *gurus* and the third *laghu*. The eight hand-movements called *mâtrâs*, named *Dhruvaka*, *Sarpini*, &c., and their allotment in each of the *mârgas*, have also been spoken of (at p. 72). In the above descriptions of *gitis* *Cha-gana*, and *Chha-gana* have been mentioned. *Ganas*, as detailed by *Sârangadeva*, were of two classes (1) *Varna-gana* वर्णगण *i. e.* those based on *varna*, or syllables, (2) *Mâtrâ-gana* (मात्रागण) *i. e.* those based on *mâtrâs* (S. R. IV, 53). The former, named by the letters *ma*, *ya*, *ra*, *sa*, *ta*, *ja*, *bha*, *na*, (म, य, र, स, त, ज, भ, न,) are detailed in S. R. IV, 57, and their values and scansion, mentioned therein, are the same as those already mentioned by me (at p. 49), in connection with Sanskrit metres, in which each of these letters, is also called a *gana*. Thus, *ma-gana* signifies three *gurus*, or — — —. *Sârangadeva* has applied these *varna-ganas* in the *Ganaila* (गणैला) varieties of *Elâ-pravandhas* (detailed in S. R. IV, 66 -93). *Mâtrâ ganas*, each of which were also named and represented by a letter, are detailed in S. R. IV, 63—65, and of these, *chha*, *pa*, *cha*, *ta*, *da* (छगण, पगण, चगण, तगण, दगण) were of 6, 5, 4, 3, 2 *laghu mâtrâs* respectively (S. R. IV, 63. *N. B.*—Here there are errors in the illustrations by signs, in the printed S. R). Applications of these *mâtrâ-ganas* can be found in the *Mâtrailâ* varieties of *Elâ-pravandhas* (which variety has already been spoken of by me at p.p. 71-72.)

By applying the above meanings of the technical terms, in the abovementioned descriptions of *gitis*, we get, for rhythm of (*talâsrita*) *Mâgadhi giti*, two *gurus*, followed by *cha-gana* or four *laghus*, followed by eight *mâtrâs* *i. e.* eight *laghu* time units; and for *Ardha-Mâgadhi giti*, we get, one *laghu* plus half of *Chha-gana*, *i. e.* half of 6, *i. e.* 3 *laghus*, totalling four *laghus*, followed by *pluta* *i. e.* time unit of three *mâtras*, plus one and a half of *chha-gana* *i. e.* plus 9 *laghus*, totalling 12 *laghu* time-units in the succeeding portion. Bereft of these technical terms, and depicting *guru* time-unit as a minim, and *laghu* time-unit as a crotchet, the rhythms of the above-mentioned two *gitis*, in European notation are :—

(Tâlâsrita) Mâgadhi giti.



(Tâlâsrita) Ardha-Magadhi giti.



The timing of the above *Mâgadhi* is described, by *Sârangadeva*, as quoted above, as beginning with, *chitra mârga* for each of the first two *gurus*, and ending with, eight *mâtrâ* hand-movements of *Dakshina mârga* for the last eight (*laghus*). This signified, according to commentator *Kallinâtha*, that each of the first two *gurus* of this *Mâgadhi*, were to be timed by the two

is not possible. Exact definition, thus not being practicable, I shall briefly describe here what is and what is not connoted by *Râga*. A *Râga* is not a mode, in the sense of *thât*, for, although each *Râga* has a *thât*

(special) *mâtrâ* hand-movements of *chitra mârga*, and the next four *laghus* were to be timed by the four (special) *mâtrâ* hand-movements of *Vârtika mârga*, and the last eight (*laghus*) were to be timed by (all the) eight *mâtrâ* hand-movements which are fixed for *Dakshina-mârga* (S. R. I. viii, 21—22 commt.) Similarly, in S. R. I. viii, 23—25, quoted above, the timing of the first four (*laghu*) *mâtrâs* of *Ardha-mâgadhi*, was directed to be done by the first two, and the last two, totalling four, *mâtrâ* hand-movements, and the timing of the last twelve (*laghu*) *mâtrâs* of this *Ardha-Mâgâdhi*, was directed to be done by all the eight, *mâtrâ* hand-movements, together with the last two, of these eight, twice performed, comprising altogether, twelve hand-movements, for this latter part of this *giti*. The above examples of these two *gitis* are in *Jugma* or *Chachchatputah Tâl*. They may, *Sârangadeva* says, similarly be, in other *Tâls* (*ibid.* 25). It will be seen, that each of the above illustrations of these two *gitis* comprises two *âvrittis* (*i. e. âvartas*) of *Jathâksharah* (or *Ekakalah*) *chachchatputâh Tâla*, and each contains variations from the strict *Jathâksharah* rhythm.

About this (*tâlâsrita*) version of the other two *gitis*, *Sârangadeva* says, *Sambhâvitâ giti* is in *Dwikalah* variety of *Tâl*, and in *vârtika mârga*, and it abounds with *guru* time-units, and *Prithulâ giti* is in *Chatushkalah* variety of *Tâl*, and in *Dakshina mârga*, and it abounds with *laghu* time-units (*ibid.* 25.)

Variations of rhythms in JATIS.—It will be seen from the above, that the *pluta*, *guru*, &c., strictly according to *Jathâksharah* or *Dwikalah* &c. varieties of *Chachchatputah*, have not been kept up in the above varieties of *gitis*, but, similar to that done in modern music (as mentioned at p. 39), *pluta*, and *guru* have, in places been subdivided into *laghus*. Similarly the *laghus*, and *gurus*, strictly according to the above (*tâlâsrita*) varieties of *Mâgadhi*, *Sambhâvita* and *Prithulâ gitis*, as mentioned above, were not always kept up in practical music, as will be apparent from their practical application in *Jâtis*, shown below. *Jâtis* as already said, were ancient classifications of *gitas* (for meaning of ancient *gita*, see p. 35). Besides rules for *graha*, *amsa* &c. notes, and of other characteristics, of *Jâti*, each *Jâti* (जाति) had ts fixed *mârga Tâl*, and also fixed number of *Kalâs* of that *Tâl*. Different *Jâtis*, however could be in one and the same *Tâl*. In the theory of each *Jâti*, *Sârangadeva* has mentioned, the number of *Kalâs* of the *Tâl*, fixed for that *Jâti* in accordance with *Dakshina mârga* (S. R. I, vii, 110), and in the practical example, for each *Jâti*, he has shown the number of *Kalâs* according to that *mârga*. He says, that, although not specifically mentioned in the theory of every *Jâti*, the three *mârgas*,—*Chitra*, *Vârtika*, and *Dakshiha*, the three *gitis*,—*Mâgadhi*, *Sambhâvitâ* and *Prithulâ*, and the three varieties of its own *Tâl*, viz.—*Ekakalah*, *Dwikalah* and *Chatushkalah*, are applicable in each *Jâti* (S. R. I. vii, 109), and that, when a *jâti* is performed in *Vârtika mârga*, then the number of *kalâs* would be twice that of (the numbers of *kalâs* of) *Dakshina mârga* (as mentioned in the theory and illustration of each *jâti*), and also when that *jâti* is performed in *chitra mârga* then the number of *kalâs* would be twice that of the abovementioned *Vârtika mârga* (*ibid.* 110—111). Thus, in the theory (simultaneously given, as already said at p. 70) of (*suddhâ* and *vikritâ*) *Sâdji-Jâti*, *Sârangadeva* has said, that there are twelve *kalâs*, each (*kalâ*) being of eight *laghus*, in this *Jâti* (S. R. I, vii, 65). Sarangadeva has also said that *Panchapânih* is the *Tâl* of this *Jâti*, and he has also especially mentioned for this *Jâti*, that all the three, viz. *Ekakalah* &c. varieties of this *Tâl*, and the three abovementioned varieties of, *mârgas*, and *gitis* are applicable in this *Jâti* (*ibid.* 61—65). In the practical example of this *Jâti*, given with a Sanskrit song, with its music in the same form of notation, as that already mentioned and quoted, for *gitis* (at p. 72) there are 12 *kalâs*, each of which is divided by a bar, numbered, and placed one below another. That illustration, according to commentator *Kallinâtha*, is in *Dakshina mârga*, with each *kalâ* of 8 *mâtrâs* (eight *laghus*), totalling, in this case, 12 *kalâs*, the whole comprising two *âvrittis* (आवृत्ति, same as modern *âvarta*, see p. 36) of *Chatushkalah Panchapânih Tal*, and that illustration is in the type of *Prithulâ giti* (S. R. I, vii, 63—65 commt.). It has already been said, that according to *Sârangadeva*, (including in this *Jâti*, as specifically mentioned in its theory), the abovementioned three *mârgas* (*i. e.* ways of singing) &c., were applicable for each, *Jâti*, and this singing in different *mârgas*, says *Kallinâtha*, could be done, at the will of the singer (*ibid.* 110 commt.) Thus, *Kallinâtha* says, in performing the abovementioned music of *Sâdji-Jâti*, in *Vârtika mârga*, *Kalâs* of 4 *laghus* each, instead of, of 8 *laghus* each, are to be formed (*ibid.* 111 commt.), making altogether 24 *Kalâs*, thus comprising four *âvrittis* of *Dwikalah Panchapânih Tâl*, and then it takes the type of *Sambhâvitâ giti* (*ibid.*, and S. R. I, vii, 63—65 commt.) In the same manner, according to *Kallinâtha*, in performing the above *Jâti* in *Chitra mârga*, *Kalâs* of two *laghus* (*i. e*, of two *mâtrâs*) each, are to be formed, by subdivision of the above, making altogether 48 *Kalâs* (*ibid.* 111 commt.) in which case it will be in *Ekakalah—Panchapânih*, and will comprise eight *âvrittis* of that variety of the *Tâl*, and in that case, it will be in *Mâgadhi giti* type (*ibid.* 63 -65, commt., & 111 commt.)

KALAS OF EKAKALAH &c. In the above illustrations, the rhythms, strictly in accordance with the theories of the *gitis* already mentioned, and of the *Ekakalah* (*i. e. Jathâksharah*) *Dwikalah*, &c. varieties of *Panchapânih* (*i. e. Shatpitâputrakah*) *Tâl*, have not been followed in detail, and each *Kalâ* of the *Dwikalah* and *Chatushkalah* varieties of that *Tâl*, instead of being formed of 2 and 4 *gurus* respectively, as mentioned in their theories (already mentioned at p. 71) consists, in the above illustrations, of 4 and 8 *laghus* respectively. From this, it may easily be inferred, that, for practical purposes, to suit the exigencies of particular cases, variations in detail, within the rhythms of these *giti* types, were allowed, and also, similar to that done in modern music (as shown at p.p. 39—40), variations, by subdividing *pluta* and *guru*, into *laghu* time units, within *kalâs*, and *pâdas* of *Ekakalah*, *Dwikalah*, and *Chatushkalah* varieties of (*mârga*) *Tâlas*, were allowed in practical music. It has already been said, (at p. 71) that *Dwikalah* and *Chatushkalah* varieties of a *Tâl*, contained two, and four *kalâs* respectively, in each *pâda*, and that each of these *kalâs* was of one *guru* (time) unit (S. R., V, 19—21). In the performance in *chitra mârga* (way of singing), of the above illustration, the *Tâl* is *Ekakalah-Panchapânih i. e. Jathâkshara-Shatpitâputrakah*, and each *âvritti* of that *Tâl*, in that case, comprises six *kalâs*, and each of these *kalâs* is of two *laghus*, which are equivalent to, one *guru*. Thus, in the above instance of *Ekakalah* variety of *Tâl*, each *kalâ* is of one *guru*. Thus, for exigencies of a particular music, each *pâda*, of the

(mode) of its own, yet several *Râgas* may have the same *thât* (ठाट), and having the same *thât*, they differ in their characteristic forms, and in other special peculiarities of their own. A *Râga* also does not signify a particular tune, for different specimens of music, of a *Râga*, may differ in their tunes although all of them may be connoted by, and may come within the characteristics of the same *Râga*. *Tâl* is also not fixed for a *Râga*. Unlike the case of the antique types of music, as spoken below, no *Tâl* is rigidly fixed for a modern *Râga*. In modern Indian Music, a *Râga* may theoretically be in any *Tâl*. Thus, different tunes and *Tâls*

Ekakalah variety could consist of one *kalâ*, each of this *kalâ* unit being of one *guru*, which was similar to the two and four *kalâ* units respectively, in each *pâda* of the *Dwikalah* and *Chatushkalah* varieties. This explains the significance of the term *Ekakalah* which literally means, having one *kalâ*. According to commentator *Kallinâtha*, the term *kalâ*, in the names *Ekakalah*, *Dwikalah*, and *Chatushkalah*, signified a time-length of one *guru* (S. R. V. 19 commt.)

It will be seen that the abovementioned three varieties of *mârga Tâls*, viz. *Ekakalah*, *Dwikalah*, and *Chatuskalah* and the three varieties of *mârgas*, viz. *chitra*, *vritti* (or *vârtika*) and *Dakshina*, and the three varieties viz. *Mâgadhi*, *Sambhâvitâ*, and *Prithulâ*, of *gitis* related to the same thing, viz. variation in rhythm, similar to what is done by, subdividing semibreves, minims, &c., into crotchets, quavers &c. and *vice versa*, in European Music, and by variation of rhythm, and *paran* &c. (as shown at pp. 42 &c.) in modern Indian Music. It may be said, by comparison with these modern methods, that much of these ancient classifications of *Ekakalah* &c. varieties, and of *mârgas* and *gitis*, were redundant, and inconsistent at places (*e.g.* strict *Mâgadhi giti*, and typical *Jathâksharah* rhythms not being practically kept up, as shown above, in *Sâdji Jâti*). Before blaming *Sârangadeva* however, for this apparent inconsistency and prolixity, one should remember that all these classifications and theories, were included in the text books of various antique periods, more ancient than that of *Sârangadeva*, and much of these ancient systems and theories, were no doubt current in *Sârangadeva's* time. *Sârangadeva*, as already said (at pp. 67–68) had condensed the systems, contained in the writings of these more ancient authorities, and had amalgamated with those ancient theories, contemporary as well as his personal, theories. This amalgamation was done no doubt, for the purpose of reducing the bulk of his book. It will be seen that the abovementioned three varieties, of (*mârga*) *Tâls*, of *mârgas*, and of *gitis*, had special application in the ancient *Jâtis*, which were classifications, of very antique periods, of *gitas*.

Rhythm rigidly fixed in Ancient Indian Music. Similar to that, as already shown, of *Sâdji-Jâti*, each *Jâti*, as classified by Sârangadeva (in S. R. I, *prakaran* vii) had a fixed *mârga Tâl*, and fixed numbers of *kalâs*. The numbers of *kalâs*, however, differed, as already said, in different *mârgas* (or ways of singing), and several *Jâtis* also, had common (*mârga*) *Tâls*. The ancient forms of music termed *Kapâla* (कपाल), and *Kambala* (कंबल), which, with their different varieties, are detailed in S. R. I, viii, 1-14, and illustrations, had each its fixed *Jâti*, and fixed numbers of *Kalâs*, in its rhythm. The rhythms, including the numbers of *Kalâs*, and the *guru*, *laghu* &c. units of each *Kalâ*, were also rigidly fixed, in the seven ancient classes of *gitakas* (गीतकानि), named *Madraka*, *Aparântaka*, (मद्रक, अपरान्तक) &c., and in the seven classes of *gitas* (गीतानि), named *Chhandaka*, *Asârita*, *Vardhamânaka*, *Pânikâ*, *Rik*, *Gâthâ*, *Sâma* (छन्दक, आसारित, वर्धमानक, पाणिका, ऋक्, गाथा, साम), altogether fourteen ancient forms of music, which were collectively called, *gitâni* (गीतानि, S. R. V, 57, 59), and also called *prakaranas* (प्रकरणानि, S. R. IV, 314 commt., V, 57). The theories of the rhythms, of words, phrases, and syllables, of composition, &c. in the structure of these fourteen classes of *gitâni*, together with the different varieties within each class, including different ancient versions of each, are detailed in S. R. V, 57-233. The rhythms of these *gitâni*, include, the metres of *mârga-Tâls*, and in some varieties, as already said, (at p. 71), typical *Jathâksharah* rhythms of *mârga Tâls*. Similar to that done for *mârga Tâls*, Sârangadeva has illustrated the rhythms of these *gitâni*, by signs for *laghu*, *guru* &c.

Patakala (पातकला). Over and above these illustrations by signs, Sârangadeva has given the *pâtakalâ*, for these varieties of *mârga-Tâls* and *gitâni*. Of the four varieties each, of silent and sonorous hand-movements already spoken of (at p. 36), the four silent hand (including finger) movements, each bearing a name, were collectively called *Kalâ* (S. R. V, 4), and the four varieties, each having a name, of the sonorous hand-movements (*i.e.* movements producing sound), were collectively called *pâtah* (पातः), and *Kalâ* (कला) also (*ibid.* 6). The *pâtakakalâ* of *mârga-Tâls* and *gitâni*, mentioned above, as illustrated by Sârangadeva, were phrases composed with the initial syllables of the names of the abovementioned *pâtah* and *Kalâ* (*i.e.* silent and sonorous movements), indicating by the initial syllables of their names (S. R. V, 28), the particular combinations of hand (including finger) movements that were to be made for beating the *Kalâs* (*i.e.* *Kalâ* time-units) of the different varieties of *mârga Tals* and *gitâni*. These movements, applied for beating *Kalâ* units, should not be confused with the eight varieties of hand (including finger) movements, termed, as already spoken of (at p. 36), *mâtrâs*. These eight varieties of *mâtrâ* hand-movements (detailed in S R. V, 12-14), were specially meant for beating the *mâtrâs* of *Kalâs*, which *Kalâ* units, consisted, as already said (at pp. 72, 74), of different numbers of *mâtrâs* in different *mârgas*, and Sârangadeva has detailed the particular combinations of *mâtrâ*-hand-movements that were to be made, for beating *Kalâs*, of different *mâtrâs*, in different *mârgas* (S. R. V, 11, 15). These *mâtrâ*-hand-movements, with their application for beating *mâtrâ* units, of *kalâs*, of different *mârgas*, have already been spoken of and illustrated (at pp. 36, 73). I have already said (at p. 36) that the modern Indian hand-movements for beating *sam*, *tâl*, and *phânk*, are similiar to some of the above-mentioned silent, sonorous, as well as *mâtrâ*, hand-movements, as detailed by Sârangadeva. Some of the finger signs for time, and of the methods of beating time of European measures, as detailed in *The Standard Course*, by John Curwen (Re-written, 1901, Fifth edition, J. Curwen & Sons Ld., London, at pp. V, 66-67), are also similar to the above-mentioned silent, sonorous, and *mâtrâ*

may be cast in the mould of a *Râga*. In this sense a *Râga* may be called a mould or a melody type. What then are the individual characteristics of a *Râga*? Various attempts have been made to show this by grammar of *Râgas*. Thus, particular modern Hindustani *Râgas*, are said, by some authors, to have particular *vâdi* notes, and also particular *vivâdi*, *samvâdi*, *graha*, *nyâsa* &c. notes, and also particular formations and blendings of notes. As for *Vâdi* (called also *jân* (जान्) note, in modern Hindustani music. G. S. S. I., iv., 27), the author is of opinion that a particular *Râga* cannot be said to have a fixed *vâdi* note. He explains this, by saying that the note *ma* is widely used in *Râgas Mâlkous* and *Kedârâ*, similiarly the notes *ga*, *pa*, and *dha* are the predominent notes respectively, in *Râgas Jhinjhôti*, *Kâlângrâ*, and *Vibhâs*, but it is

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hand-movements. With a view to help those, who may be desirous of making a comparative study of these ancient and modern methods of timing by hand-movements, a brief description of these ancient hand-movements, and their application for beating *pâdas* &c., as detailed by Sârangadeva, is given below.

The four silent hand-movements were as follows:—The first was bending, and in this way closing, (one or more) fingers of the upward out-stretched palm (*i.e.* of palm with stretched fingers), the second of this movement, was stretching the (bent) finger or fingers of the palm placed downwards, the third was a right-side motion of the outstretched upward palm (*i.e.* of the palm with stretched fingers), the fourth movement was moving the outstreched palm downwards and bending (and thereby closing, one or more) fingers (S. R. V. 7-8). The particular finger or fingers that were to be used in particular cases, were those mentioned below. The four sonorous movements were:—the first, named *dhruvah* (ध्रुवः) was the downward movement of a hand producing sound, proceeded by *Chhotikâ* (छोटिका) sound, *i.e.* sound, produced by snapping the thumb with the forefinger, or middlefinger. The second, third, and fourth, of these sonorous movements were, sounding by downward motion of the right, left, and both hands (*i.e.* palms) respectively (S. R. V, 9), The eight *mâtrâ*-hand-movements, already spoken of, as described by Sârangadeva, were as follows:—The first named *dhruvakâ* or *dhruvâ* (ध्रुवका, ध्रुवा) was a sonorous movement (Sârangadeva probably meant by this sonorous movement, a movement similar to the abovementioned sonorous movement, termed *dhruvah*). The second of these *mâtrâ*-hand-movements was the leftways motion of the hand, the third was the rightways motion of the hand, the fourth was the downwards motion of the hand, the fifth was the motion of the hand outwards, the sixth was bending and thereby closing the fingers, the seventh was motion upwards of the hand, and the eighth motion was, from the above upward position, striking with the hand by downward motion.

It will be seen, that some of these *mâtrâ*-hand-movements were similar to some of the silent and sonorous movements, mentioned above, and thus these classifications of Sârangadeva seem to be overlapping. It should be remembered that Sârangadeva had applied these *mâtrâ*-hand-movements (S. R. I. viii, 21-22 commt.) for the especial purpose, as already said, of beating the *mâtrâs* of *kalâs* of different *mârgas*, and the silent and sonorous movements, for beating *kalâs* of *mârga-Tâls*, and of other rhythms. Sârangadeva had no doubt collected these different sorts of movements from different ancient authorities, in which they were meant for serving different purposes, and in mentioning them, side by side, and co-ordinating them, he had put, and shown the application of these ancient methods, in a condensed form, and he had also, explained thereby these anterior methods, of more or less anterior periods, of which, many of the theories and technical terms, it might easily be inferred, were current in his time. Sârangadeva's, description and classifications should, therefore be seen in the light of their practical applicability and the especial function of each. The simultaneous, and also consecutive application of these different sorts of hand-movements, as detailed by Sârangadeva, should also be seen in this light. Thus, in the description of the four silent movements (termed collectively *Kalâ*) the particular hand or finger or fingers that were to be used, is not mentioned. In S. R. V, 36-40 Sârangadeva details the particular finger or fingers that were to be moved for beating different *pâdas* of different (*mârga*) *Tâls*. These hand-movements for different *Tâls* &c. as illustrated by Sârangadeva by *pâtakalâ* phrases, include both silent and sonorous movements. Sârangadeva advises that the beating of these *pâtah i.e.* sonorous-movements, should not be done with the abovementioned, specified fingers (S. R. V, 40). This injunction, according to commentator *Kallinâtha*, is due to the fact, "that if the sonorous movements be made with these particular fingers, the sound produced thereby, would not be prominent, hence, the whole palm should be used for these sonorous movements" (S. R. V, 40 commt.). Thus, the abovementioned movements of particular fingers, for particular *pâdas*, were meant by Sârangadeva for the four silent movements. As regards the particular hand that was to be used in these (silent movements) Sârangadeva has advised that these (silent movements) were to be made with the particular hand or hands, with which, the succeeding *pâtah i.e.* sonorous movement (as indicated by the *pâtakala* phrases) was to be made (S. R. V, 39).

As regards the first sonorous movement, termed *dhruvah* mentioned above, and the *dhruva-mârga* (each *Kalâ* in which, was of one *mâtrâ*) mentioned before (at p. 72), it appears that none of these two, have been used by Sârangadeva, in the different *mârga Tâls*, and in the hand-movements, indicated by their *pâtakâlâs*. *Dhruva mârga* has also not been applied, it will be seen, in the variations of *mârgas* of *Sâdji* and other *Jâtis* mentioned before (at p. 74). The mention of this *dhruvah* movement, and *dhruva-mârga* by Sârangadeva, should not, nevertheless, says Kallinâtha, be "considered redundant, as *dhruvah pâtah*" (*i.e.* sonorous movement), "is applicable in *dhruva-mârga*, and (each *kalâ* of this *mârga*) being of one *mâtrâ*, a *gita*, composed in *chitra* &c. *mârgas*, can, at the will of the singer, be perfomed in *dhruva-mârga*, and this *mârga* is also part and parcel of other *mârgas*, as the *Kalâs* of these other *mârgas* are divisible into *Kalâs* of one *mâtrâ*. *Dhruvah-pâtah* "(ध्रुवः, *i.e.* sonorous movement)" is necessary for the abovementioned performance in *dhruva-mârga*. Thus *dhruvah-pâtah*, and *dhruva mârga* is inherent and present everywhere, and so, they being *dhruva* "(*lit.* meaning certain)," their use has not been particularly shown by Sârangadeva, in the illustrations of *mârga Tâls*. Sârangadeva, however, has shown the application of *dhruvah pâtah* in *Upôhana*" (parts of *gitâni*),

very difficult to find other modern *Râgas*, having similar particular predominant notes (G. S. S, I. ix, 68). About the theory of the abovementioned *Râgas* having these particular predominant notes also, the author adds, that departure from that theory is found to actually exist in practice. The author says:—"One, who is well versed in performing *Râga Kedârâ*, may practically very well express its form by using the note *ma* infrequently," (*ibid.*), The author continues,—"Many think that the note *ma* is *Vâdi* in all varieties of *Râga Mallâr*, and also in *Râgas Bâhar*, *Bhairava*, *Bhimpalâsi*, *Megha*, and *Lalita*, and the note *ga* is *Vâdi in Râgas Behâg*,, *Purîâ*, *Hindol*, *Jayanta*, and *Gaursâranga*, and the note *pa* is *Vâdi* in *Râgas Iman-Kalyân*, *Kalyân*, *Kâmôd*, *Jôgia*, *Sree*, *Râmkeli*, *Multâni*, all varieties of *Tôdi*, *Sâhânâ*, and *Arânâ*, and the note *dha* is *vâdi* in *Râgas Hâmbir*, and *Alâhia*, and the note *ri* is *Vâdi* in *Râgas Chhâyânat*, *Vrindâvani-Sâranga*, and *Kânârâ*. Actually, however, there is no such fixed *Vâdi* in these cases, for others well equipped in (Hindustani) music may say otherwise. One may say that *pa* is *vâdi* in *Râga Iman-kalyân*, another may say, 'why should not *ga* be called *vâdi* in that Raga,' as note *ga* is as much necessary in that Raga as *pa*, and notes *ri* and *ni* and even *kari-ma* (*ma*-sharp) are of similar importance in that Raga. Expert musicians, well versed with Ragas, may perform *Iman-kalyân*, by using any of these notes with the greatest frequency, without deforming that Raga, although inexpert

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"and has also shown the application of *dhruva-mârga*, in *dhruvâsârita*," (which is) "a variety of *âsârita* according to some version" (of the different versions of classifications of *âsârita*, as mentioned by Sârangadeva), "and" (the above *dhruvah-pâtah*, and *dhruva-mârga* have) "also" (been applied) "in *Jathâkshara-âsârita*. Thus, these theories (of classification) and applications" (of these movements and *mârgas*) "are not redundant" (S. R. V, 41 commt.). All other Sârangadeva's classifications, as detailed in S. R., should also, be seen in this light of their collections from different ancient and contemporary sources, which have been juxtaposed, and put in a condensed form, in S. R.. *Upohana* (उपोहन), mentioned above, was an ancient form of prelude, to some antique *gitas*, performed on the basis of the *sthâyi* note of the *gita*, with such collections of syllables as *Jhantum* &c., or a prelude, expressing the *Tâla* of the *gita*, by indicating its *guru*, *laghu* &c. time units, *kalâs*, &c. (S. R. V, 62 commt.). For more detailed description of *upôhana*, with quotation from Bharata's *Nâtya Sâstra* on the subject, see this commt.. For examples of application of *dhruvah-pâtah* (*i. e. dhruvah* sonorous movement) in *upôhana* part, spoken of above, see S. R. V, 65, 187, and for theory, and different versions of classifications of *âsârita* (आसारित one of the 14 *gitâni*), see S. R. V, 178—193, and for *dhruvâsârita*, and *jathâkshara âsârita* classifications of *âsârita* and the abovementioned application in these, of *dhruva-marga* see *ibid.* 192 and 193 respectively.

The abovementioned *jhantum*, and phrases composed with similar syllables, such as *jhantum digi digi* झंटुं द्रिगि द्रिगि &c., used as parts and parcels of antique *gitas*, strictly according to rules of *laghu*, *guru* &c. of these *gitas* (*e. g.* in S. R. V, 197—201 and commt.) or similar phrases, and also *stova* syllables [*i. e.* syllables formed with letters '*o*' (ओ), '*ha*' (ह), &c., supplemented to the words of a *gita* (or verse) in order to complete its *pâdas* or *kalâs* (S. R. V. 222, 224, 227, and commts.) thereby bringing the *gita* in the shape of, and performing it, strictly according to the theory of, the rhythm of the *gita*] were said to be originally employed in some *gitas*, which were composed, for purpose of *sreyah* (श्रेयः) *i. e.* welfare, bliss, final happiness or liberation, by god *Brahmâ* (S. R. V. 198, 200). These *Jhantum* &c. syllables and also *stova* (स्तोभ) syllables were also used in the *Kapâlâ gitas* mentioned below, composed by god *Brahmâ*.

Rhythm rigidly fixed by theory in antique gitas—I have already said (at p. 75) that each *jâti* had its fixed *Tâla*, and the number of *Kalâs* of each *jâti* were also rigidly fixed by theoretical rules. I have also mentioned (at *ibid.*) that the rhythm, including numbers of *kalâs*, and *laghu*, *guru* &c. of each *kalâ*, were rigidly fixed by theoretical rules in the 14 *gitâni*. Similarly the rhythm, and numbers of *kalâs*, were also rigidly fixed by theory, in the antique types of *gitas*, called *Kapâla*, which are detailed below. In order to conform to these strict ancient rules of rhythm, *stova* syllables were used. I have already said that the *stova* syllables were syllables that were supplemented to the words and phrases of these antique *gitas*, in order to bring these *gitas* into the shape of, and to perform them strictly according to the theoretical rules of, their rhythm. These *stova* (स्तोभ) syllables are exemplified in the *Kapâla* song quoted below. For other examples of *stova*, see illustrations of other *kapâlas* in S. R. I, viii, 14 illustrations, and for meaning of, and theories of applications, in other *gitas*, of *stova*, see S. R. V. 222, 223, 224, 227, 232, and commts..

KAPALA (कपाल). *Kapâlas* were very antique types of *gitas*, which were of seven varieties, each of which originated from, and named after, each of the seven *suddhâ-jâtis* respectively. These *Jâtis*, as already spoken of before, were very ancient classifications of *gitas*, and Sarangadeva, in S. R. I. prakaram vii, has detailed the theories of the seven *suddhâ* (*i. e.* pure) and seven *vikritâ* (*i. e.* changed from pure types) *jâtis*, each of these seven varieties being named after each of the seven notes (*sadja*, *rishava*, *gândhâra*, *madhyama*, *panchama*, *dhaivata*, and *nishâda*), and Sarangadeva has also detailed the theories of eleven mixed-*jâtis*, *i. e. jâtis* formed of the mixture of these seven *vikritâ jâtis*. Besides the characteristics as regardes *graha*, *ansa*, *nyâsa* &c. notes, frequency, infrequency, particular juxtaposition &c. of notes, and of other peculiarities of the *suddâ-jati*, from which it originated, each variety of *kapâla* had also especial characteristics of

musicians, having not much insight in the art, may not be able to do so. Thus, the abovementioned rules for *vâdi*, and *samvâdi*, have no sound scientific basis. It can easily be seen, that these are mere imaginary rules. These theories regarding *vâdi*, and *vivâdi*, are no doubt elements of the grammar of music. That grammar should be of as much help to music, as grammar of a language is, for learning that language, yet, although I can not speak of the practice of ancient times, but about modern times, I can speak with certainty, that no one has learnt to perform a Raga, with the help of any *vâdi* or *samvâdi* notes of that Raga. It can be said to the contrary, that the introduction of *vâdi* and *samvâdi* notes, at the time of learning a Raga, proves to be a great hinderance, instead of being helpful to a beginner. This is due to the fact, that no unalterable *vâdi* or *samvâdi* note can be affixed with certainty, to a particular Raga....." (G. S. S. Vol. I, ch. ix, pp. 68-69).

From ancient Sanskrit text books of music, printed after the writing of G. S. S., it can be ascertained, that similar to what is spoken of above, by the author of G. S. S., about modern Hindustani Ragas, in ancient systems of music also, while one note might be found to be predominantly, and the most profusely, used in a particular Raga, the same Raga could be performed by using some other note most profusely,* and from these ancient systems we also find, that besides the *vâdi* note, a few more notes,

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its own, and these especial characteristics of each, are detailed in S. R. I. viii, 1-9, and Sarangadeva also says that the type of music of a particular variety of *kapâla* is applicable for a *Râga*, which has for its *Janaka* (जनक *i. e.* parent, or origin) the same *suddhâ jâti*, as that of the particular *kapâla* (*ibid.* 1). In S. R. I, viii, 14 illustrations, the *Brahmâ*—composed *padas* (*ibid.* 10, 14), for each variety of *kapâla* have been quoted, by Sarangadeva but he has not given any music in notation for these *padas*, or any other example illustrating the theories of notes &c. of these *kapâlas*. The abovementioned *padas*, which include words, phrases, and *stova* syllables, were, says Sarangadeva, "composed by god *Brahmâ* (*ibid.* 14) in adoration of god *Siva*, and by properly singing a *kapâla*" strictly according to its theory of "notes and with its *Brahmâ*—composed *padas*, the singer attends *kalyâna*" (कल्याणभाग्भवेत्) *i. e.* attends bliss, welfare, happiness or prosperity (S. R. I, viii, 10 and commt.). The abovementioned heavenly god *Brahmâ* (ब्रह्मा) should be differentiated from *Brahman* (ब्रह्मन्), the supreme Being, mentioned before (at p. 66). Of the *Brahmâ*—composed *padas*, of each of the seven varieties of *kapâla*, mentioned above, the *padas* of *sâdji kapâla* are quoted below :—

झण्टुं झण्टुं ॥ १ ॥ खट्वाङ्गधरम् ॥ २ ॥ दंष्ट्राकरालम् ॥ ३ ॥ तडित्सदृशजिह्वम् ॥ ४ ॥ हौ हौ हौ हौ हौ हौ हौ हौ ॥ ५ ॥ बहुरूपवदनं घनघोरनादम् ॥ ६ ॥ हौ हौ हौ हौ हौ हौ हौ हौं ॥ ७ ॥ ऊं ऊं हां रौं हौं हौं हौं हौं ॥ ८ ॥ नृमुण्डमण्डितम् ॥ ९ ॥ हुं हुं क ह क ह हुं हुं ॥ १० ॥ कृतविकटमुखम् ॥ ११ ॥ नमामि देवं भैरवं ॥ ॥ १२ ॥ इति षाड्जीकपालपदानि ।

According to its theory, this *sâdji* variety of *kapâla* consisted of 12 *kalâs*, and in the above example, these 12 *kalâs* of the *padas* are formed by words, phrases, and also the *stova* syllables hau hau (हौ हौ) &c., formed with *stova* letters (स्तोभाक्षराः, which is misprinted as स्तोमाक्षराः in S. R. I, viii, 13-14 commt.), 'ha' (ह) &c.

From the compositions of the syllables, phrases, and words of the abovequoted *padas* and of similar *padas* of the other six varieties of *kapâla* quoted in S. R, I, viii, 14 illustrations (spoken of above), it is apparent to a Bengali reader, that these *kapâlas* were the remote predecessors of the modern songs, and vocal music, composed of similar words and phrases, generally in adoration of god *Siva*, which are sung in connection with festivities, during *Sivarâtri* (शिवरात्रि) and *Chadakpujâ* (चड़क पूजा), called *Gâjan* (गाजन) festivities of *Siva*, in Bengal generally, and the particular form called *Gambhirâ* (गम्भीरा) music in the District of Maldah, of Bengal. These *Gâjan* songs, vocal music, dances, and religious rituals in connection therewith, although varying in detail in different localities, are prevalent generally in western Bengal, and especially in the District of Birbhum, and reighbouring places, of that part of Bengal.

In connection with ancient *Tâla*, I have digressed to various other connected ancient subjects and theories. The rigid rules of rhythm of the ancient types of *gitas*, mentioned here, are, however, so inter-connected with the theories of ancient *Tâlas*, that one cannot be properly understood without the help of the other. This is my excuse for the digression.

* Somanatha in R. V. I. 37-38 and commt., mentions that, in course of performing a Raga, the function of the *vâdi* note (one of whose functions was profuse use) might be given to a note which bears *samvâdi* relation to that *vâdi* note, thereby giving to that *samvâdi* note a prominent position (including profuse use), and to the original *vâdi* note, a subordinate function, and the characteristics of that Raga could be preserved thereby. Kallinatha, In S. R. I, iii, 51-52 commt., also says that the Raga and (also) *jâti* (of a *gita*) is not destroyed, if a *vâdi* and its *samvâdi* be replaced by each other. The above remark of Kallinatha, is in accordance with the corrected reading, जातिरागहानिर्नभवति ("*Jâti* and *Râga* are not *destroyed*") as suggested by the learned editor of S. R. Poona. That the above reading is correct, and the reading जातिरागहानिर्भवति

could have profuse use, and the general rules for frequency and infrequency of notes were actually departed from in special cases, and under special circumstances, and also in exceptional cases.* Modern

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("*Jâti* and *Râga* are destroyed"), of the original manuscript copies from which the above S. R. commt. was printed, is incorrect, would be obvious, from the abovequoted remarks of Somanatha. *Vâdi* and *Samvâdi* (spelt as *Bâdi* and *Sambâdi*) have been mentioned before by me (at p. 21). Their meaning and significane in ancient music, will be further explained hereafter.

*In ancient theory, as mentioned in S. R., profuse use was included within *bahulatvam*, or *bahutvam* or *bahula* (बहुलत्वम्, बहुत्वम, बहुल) use, and infrequency was included within *alpatvam* or *alpa* (अल्पत्वम्, अल्प) use. "*Bahutvam*" says Sarangadeva, "is द्विविधं" (the reading विविधं here in printed S. R. I, vii, 49, is incorrect. The correct reading appears in *ibid.* commt., and in *s.c.* S. R. Cal. I, vi, 47) *i.e.* of two sorts, "from (1) *alanghanam* (अलङ्घनं) *i.e.* broad use, or the note being performed wholesale, and not merely slightly touched, and (2) *abhyâsa* (अभ्यास) *i. e.* frequent use or profuse use, and both these forms of *bahutvam* are the functions of *paryâyânsa* notes and also of *vâdi* and *samvâdi* notes." (S. R. I, vii, 49 and commt.). "*Alpatvam* also" Sarangadeva adds, "is of two sorts, from (1) *anavyâsa*" (अनभ्यास) *i. e.* infrequent use, or being used very sparingly, "which variety of *alpatvam* is seen generally in *anansa* notes, and this is the case of *lopya* notes also (S. R. I, vii, 50 commt.), and (2) *langhanam* (लङ्घनम्) *i. e.* being slightly touched, or inconspicuous use, and this variety of *alpatvam* is generally the case of *lopya* notes but some authorities on music, are of opinion, that this second variety of *alpa* use occurs amongst *anansa* notes also" (*ibid.* 50-51 and commt.). Of these varieties of notes, and of their frequency or infrequency, I shall first explain, *vâdi* or *ansa* note, and its *bahula* use.

VADI (वादी), or ANSA (अंश) note. I have spoken previously (at p. 35, note) on *gita*, and its *graha* and *nyâsa* notes. I have also spoken before (at p. 21 notes,) of *ansa* and *vâdi* (there spelt as *ansha* and *bâdi*) notes. In ancient theory, besides *graha* and *nyâsa* notes, a *gita* had its *ansa* note, (also called the *vâdi* note), which was the basis of its melodic structure. Says Sarangadeva, "*vâdi* note has *bahula* application" (S. R. I, iii, 49) and, "that note, which expresses the agreeability" (*i.e.* entertaining function) "of a *gita*, and the *samvâdi* and *anuvâdi* notes of which note, appear in *bahula* in *vidâri*" (विदारी *i. e.* sub-divisional parts, S. R. I, vii, 31 commt., II ii, 25 commt.) "of a *gita*, that note which is the basis for the rise to *târa*" (तार *i. e.* upper octave) "and fall to *mandra*" (मन्द्र *i. e.* lower octave), "that note which itself, or some other note, bearing *samvâdi* or *anuvâdi* relation with which, appears as *nyâsa*, or *apanyâsa*, or *vinyâsa*, or *samnyâsa*, or *graha* note, that note which has *bahula* application, is the *vâdi* note, and that note, on account of its capability" (*i. e.* importance), "is called *ansa* note. *Bahulatvam* in use, and *vyâpakam*" (व्यापकं *i. e.* extensive use) "is the *lakshanam*" (लक्षणं *i. e.* indication and sign) "of *ansa* note." (S. R. Cal. I, vi 30-32 and Sinhabhupala's commt., s. c. S. R. Poona I, vii 31-33.). Portions of the above texts, as interpreted by Kallinatha, a little differently, in the above mentioned S. R. Poona, I, vii, 31-33 commt., are as follows,—".....that note which sometimes appears as its own *samvâdi*, and of which some other note is *anuvâdi*, that note, which appearing as *nyâsa*, or *apanyâsa*, or *vinyâsa*, or *samnyâsa*, or *graha* note, has *bahula* application, is the *vâdi* note....." The meanings of the above-quoted terms, *vinyâsa*, *samnyâsa*, *samvâdi*, *anuvâdi*, will be explained hereafter. From the significance of these terms, the above-quoted *Sinhabhupâla's* commentary, seems to me to give the correct interpretation. I shall next explain the terms, *paryâyânsa*, *anansa*, and *lopya* notes mentioned before, and their frequency or infrequency.

PARYAYANSA, ANANSA, AND LOPYA (पर्यायांश, अनंश, लोप्य) notes. I shall explain the first two terms from an example. I have mentioned before, (at p. 70, note) the places in S. R. in which the general and special rules for *suddhâ* and *vikritâ jâtis* can be found. In the general rules for both *suddhâ* and *vikritâ sâdji-jâtis*, simultaneously given in S. R. I, vii, 61-65, it is mentioned that :—the five notes *sa*, *ga*, *ma*, *pa*, *dha* can be the *ansa* (*i. e. vâdi*) notes of *sâdji-jâti*, and by omission of *ni* this *jâti* can be *shâdava* (hexatonic), and when *purna* (*i. e.* heptatonic), the *vikrita* note, *kâkali-ni* (in place of *suddha-ni*) is found in this *jâti* on rare occasions. In this *jâti*, there is *sangati* of *sa* with *ga*, and also of *sa* with *dha*, and *ga* also becomes *bahula* in this *jâti*, and when *ga* is its *ansa* note, *ni* is not then omitted. (The meaning of *sangati* will be explained hereafter). The elements of these general rules which depart from the rules for *suddhâ-sâdji*, obviously refer to *gitas* in *vikritâ-sâdji-jâti*. Amongst the general rules for *suddhâ-jâtis* mentioned in S. R. I, vii, 1-2, we find, that *suddhâ-sâdji-jâti* is *purna* (*i. e.* heptatonic) and *sa* is its *ansa* note. Thus, bearing all the other necessary attributes of *sâdji-jâti*, a *sampurna* (*i. e.* heptatonic) type of *gita*, having *ma* as its *ansa* (*i. e. vâdi*) note, could be in *vikritâ-sâdji-jâti*. Of such a *gita*, *ma* will be the *ansa* note, and *sa*, *ga*, *pa*, *dha* (which notes could be the *ansa* notes of other *gitas* of this *vikritâ-sâdji-jâti*) would be its *paryâyânsa* notes, and *ri* and *ni* (which could not be the *ansa* note of any *gita* of this *vikritâ-sâdji-jâti*) would be the *anansa* notes of this *gita* (re *paryâyânsa* and *anansa* notes, see S. R. I, vii, 49-50 commt., and 105-106 commt.). From the general rules for *bahutvam* quoted before, it will be seen, that in the *gita* with *ma* as *ansa* note, spoken above, not only the *ansa* note *ma* would be *bahula*, but the *paryâyânsa* notes *sa*, *ga*, *pa*, *dha* also, could be *bahula*, and the special rules of the *jâti* to which this *gita* belongs, as mentioned above, also say that in it, *ga* could be *bahula*. From the general rules for *alpatvam* quoted before, we also find, that in the above *gita*, and in all *gitas* of *vikritâ-sâdji-jâti* the *anansa* notes *ri* and *ni* would be applied with *alpatvam*. That rule also speaks of alpatvam to be the element of *lopya* notes also. I shall now explain the meaning of these *lopya* notes. Like modern Hindustani music (as mentioned at p. 13), ancient Indian music also, was either *sampurna* (also called *purna i. e* heptatonic)

text book writers on Hindustani music, not properly understanding, this ancient theory, and also, the systems of ancient music, have tried to affix to each modern Raga, a fixed *vâdi* (in the sense of the most prominent or the most profusely used) note, some *samvâdi* notes, and some *vivâdi* (in the sense of omitted) notes. Modern writers use this *vivâdi* in the sense of omitted notes. *Vivâdi* did not mean omitted notes in ancient music. These omitted notes were called, in ancient systems, *lôpya* notes, and also *varjjita* (वर्जित) notes, and these two terms are used for omitted notes, in modern Hindustani music also. *Samvâdi*, *anuvâdi*, and *vivâdi*, in ancient music, signified peculiar relations of notes with each other, which relations, and theory of *vâdi* or *ansa*, *graha*, *nyâsa*, *apanyâsa* &c. notes, originated from, and were the parts and parcels of the musical theory of very antique periods, which in many respects, were different from modern ones. The system of notes, and *thâts* of all modern Indian Râgas, are founded upon, the tuning of Indian stringed instruments on the basis of *sa*, and on the modern Hindustani system of 12 notes, of which 7 are *suddha* and 5 *vikrita*.* This (modern) method of

or, (as mentioned in S. R. I, vii, 54-57) *shâdava* (*i. e.* hexatonic) or *audava* (*i. e.* pentatonic. This word *audava* has been spelt at p. 13 as *auraba*). In antique periods, the note or notes, that were omitted, either in its, or their *suddha* or *vikrita* forms, in the *shâdava* and *audava* classes of *gitas*, were the *lopya* notes of these *gitas* or classes of *gitas* (S. R. I, vii, 50 commt.). Thus, in a particular *shâdava gita*, of the abovementioned *vikitâ sâdji jâti*, *ni* would be the *lopya* note, and, as mentioned in the general rules quoted before, this *ni* would be applied in this *gita*, with *alpatvam*. These general rules of *bahutvam* and *alpatvam*, were departed from, as said by me before, in special cases. I shall deal with this next.

The special rule of *ga* being *bahula* in *sâdji-jâti* has already been mentioned. The general rules for *bahulatvam* and *alpatvam* were also modified in cases of *antaramârga*, and also in classes of *gitas* (such as *Râgas* and *Jâitis*), which had the peculiarity of some notes, being *samaswarâh* (समस्वराः) *i. e.* equally *bahula* or equally *alpa*. This word *alpa* is the adjective of *alpatvam*. An example of this *samaswarâh* would be found in *Sri-Râga* (a *desi-Râga*) of S. R. In the theory of this *Râga*, is mentioned, that *sa* is its *ansa* note, that it is derived from *sâdji-jâti*, that, in it, *pa* is *alpa* and the other notes (*i. e. sa*, *ri*, *ga*, *ma*, *dha*, *ni*) are *samaswarâh* (S. R. II, ii, 161). For being *samaswarâh*, the latter six notes, as they included, the *ansa* (therefore *bahula*) note *sa*, were equally *bahula* (*ibid.* commt.) In this way, this *Râga*, although it was derived from *sâdji-jâti*, it departed from the rules of *alpatvam* and *bahulatvam* of *sâdji-jâti*, already mentioned. Similarly, in the theory of Raga *Mâlavasri* is mentioned that it is derived from *Mâlavakaisika Râga*, and in it *sa* is *ansa* note and all its notes are *samaswarâh* *i. e.* (as mentioned above) equally *bahula* (S. R. II, ii, 72 and commt.) Thus, in it, the function of its parent *Râga Mâlavakaisika* having *alpa dha* (*ibid.* 70), is departed from. Similar to the above examples of equal *bahulatvam*, *samaswarâh* might signify equal *alpatvam* also (S. R. II, ii, 72 commt., 161 commt.). I shall now speak of *antaramârga*, and the departure through it, from general rules.

ANTARAMARGA (अन्तरमार्ग). According to Sarangadeva, the *sangati* (*i. e.* proximity), with the *ansa* &c. notes, of the *alpa* notes, of a *gita* (or of a class of *gita*), and in the course of this *sangati*, the *alpa* notes appearing not in the places of *nyâsa* &c., but in intermediate portions between these places of *nyâsa* &c. of the *gita*, and the abovementioned *sangati* being formed in variegated ways, in course of which, the *alpa* notes are applied occasionally with *anavyâsa* (*i. e.* sparingly), occasionally with *langhanam* (*i. e.* being slightly touched or inconspicuously used), and in this way variations and novelties are introduced, is called *antaramârga* (S. R. I, vii, 52-53), Both the elements of *alpa* notes, viz. *anavyâsa* and *langhanam* (explained before) are applicable in above (*ibid.* commt.). *Ansa* &c. notes, mentioned above, meant *ansa*, *graha*, *apanyasa* &c. notes, and the abovementioned *nyâsa* &c. signified places of *graha*, *ansa*, *nyâsa*, *apanyâsa*, *vinyâsa*, and *samnyâsa* notes (*ibid.* commt.). Of these, *apanyâsa*, *samnyâsa*, and *vinyâsa* were the ending notes, and the places of ending, of the subdivisional parts of a *gita* (S. R. I., vii, 41, 4J-48, and commts. The particular varieties of each of these notes would be explained hereafter). *Graha* *ansa*, and *nyâsa* have been explained before. *Sangati* (संगति) mentioned above, meant, proximity in course of ascension or descension (S. R. I. vii, 52-53 & commt.) *e. g.* the *sangati* of *sa* with *ga*, and of *sa* with *dha* in *sâdji-jâti* mentioned before (at p. 79) would be like *sa ga sa ga sa dha*, or *ga sa ga sa dha sa* &c. (S. R. I, vii, 62 commt.). *Thus* the *sangati* in *antaramârga*, referred to above, was the *sangati* of the *alpa* notes, with *graha*, *ansa*, *nyâsa*, *apanyâsa*, *vinyâsa* and *samnyâsa* notes of a *gita*, and the application, of these *alpa* notes, in the course of above *sangati*, was not in places of beginning and ending, and of the ending of sub-divisional parts, of the *gita*, but in intermediate positions between these places of beginning and ending. "As a general rule, *antaramârga* occurred in *gitas* of *vikritâ-jâtis* only" and very rarely in gitas of *suddhâ jatis* (S. R. I, vii 53 and commt,). Through *antaramârga*, *alpa* notes could have *bahula* use. For example, amongst several *jâtis* mentioned in S. R. from the theory of *Kârmâravi jâti*, we find, that the three notes *sa ga ma* were its *anansa* [notes (which, by general rules quoted before, at p. 79 should have had *alpa* use) yet these *anansa* notes, as mentioned in the theory of that *jâti*, nevertheless, had *bahula* use in that *jâti*, through the existence of *antaramârga*, and it is also especially mentioned in the theory of that *jâti*, that in it, (the *anansa* note) *ga* was very much *bahula* (S. R, I, vii, 101-102 and commt.). In connection with the English translations of S. R. I, vii, 29, given in *Intro. To Ind. Music* IV, 63, Mr. Clements explains *antaramârga* (spelt *antarmârg* by him), as "the relations of the *Vâdi* with other notes." This explanation is not only incomplete, but also misleading.

* These notes, as said before, are the seven suddha notes, *sa ri ga ma pa dha ni*, and the five *vikrita* notes, *komal* (*i.e.* flat) *ri*, *komal ga*, *kari* (*i. e.* sharp) *ma*, *komal dha*, and *komal ni*. These are the names of these twelve notes in Bengal. Some of these notes are known by different names in other provinces. Thus, in some places, the above *suddha-ma*, and *kari-ma*, are termed *komal-ma*, and *tivra-ma*, respectively, and in some places the abovementioned four *suddha* notes, *ri ga dha ni* are called

tuning; and the theory of all modern *thâts* based thereon, and the author's opinion about the artificial character of these *thâts*, due to the abovementioned basis of tuning, and the uncertainty of pitches of *kari* and *kômal i. e. vikrita* notes therefor, and his inference that ancient Indian modes were more natural, and his suggestions for simpler and more natural modes, in places of the modern *thâts* that include many *vikrita* notes, have already been dealt with (at pp. 2, 14, 16-20 &c.). By more natural modes suggested by the author, as spoken of above, the author meant that, music written in those *thâts* would be much easier for performance direct from notation, without previously learning the music *viva voce*, than, music written in the prevalent *thâts*, which included many *vikrita* notes, as the former included mostly *suddha* notes and thus had not the uncertainty of pitches of *vikrita* notes of the latter (G. S. S. I, xvi, 215). The above opinion of the author, about the artificiality of those modern *thâts* which include many *vikrita* notes, and his inference about the existence, in ancient periods, of simpler modes and his inference that the function of those modern artificial *thâts*, which abound with *vikrita* notes, were served by some other methods in ancient systems (G. S. S. I. xvi, 208), are found to be fully justified and quite correct, from the data that can be gathered from the complete S. R. and other ancient Sanskrit text books on music, printed and published after the writing of G. S. S. From the systems of very antique peridods, as referred to and applied, in S. R., to both *mârga* (*i. e.* of very antique origin) and *desi* * (देशी *i. e.* provincial, local, ore ontemporary) practical music, including *Râgas* and other classes of *gitas*, we find that in their theory, besides

tivra ri, tivra ga, tivra dha, tivra ni, respectively. The intervals between the abovementioned *suddha* notes, and the theory of *dha* being different from European *La*, have been mentioned before (at p, 6 &c.) The intervals of the abovementioned *vikrita* notes are uncertain, and *Ostâds* (*virtuosos*) who speak of *sruti* intervals of these *suddha* notes, cannot mention definitely, the *sruti* or any other intervals of these five *vikrita* notes. In Karnatic music (*i. e.* music of Southern India) though the *suddha* notes bear the same names *shadja, rishava gândhâra, madhyama, panchama, dhaivata, nishâda* (षड्ज, ऋषभ, गान्धार, मध्यम, पञ्चम, धैवत, निषाद) and are termed by the same initial sounds of these seven names *viz.* by *sa ri ga ma pa dha ni* (स रि ग म प ध नि) respectively, yet the intervals between these seven Karnatic *suddha* notes are not exactly the same as those between the seven Hindusthani *suddha* notes. Thus, though bearing the same names the *suddha* notes of the Karnatic system are different. Besides these, the *vikrita* notes of the Karnatic system are also different from those of the Hindusthani system. I have mentioned these in detail in the Appendix (written by me, in Bengali) to G. S. S. Vol. I.. I have not detailed them here, as G. S. S. as already said (at p. 15) deals with the Hindusthani system only,

**Mârga* and *Desi* (spelt as Deshi) music, have already been spoken of at p. 64.

Of S. R., the author of G. S. S. had seen only *Sangita-Ratnâkar* by Sârangadeva, with commentary of *Sinhabhupâla* (this commt. being named *Sangitasudhâkara*), edited by *Kâlivara Vedântavagisa* and *Sâradâ Prosâd Ghosha*, The New Arya Press, Calcutta 1879, containing chapter I (*Swarâdhyâya*) only, of S. R. This book has been referred to before, and will be referred to hereafter, abbreviated as, S. R. Cal. The *Prakaran i. e.* sub-chapter numbers, and verse numbers of this book are not the same as that of S. R. Poona mentioned before. The latter contains complete 7 chapters of S. R. The abovementioned S. R. Cal. is long out of print, but a few copies of S. R. Poona may still be available by searching from sanskrit book sellers of various parts of India. The author of G. S. S. had also seen *Sangita-Pârijâta* by Aohbala, edited by *Sârada Prosâd Ghosha* and *Kâlivara Vedântavâgisa*, The New Sanskrit Press, Calcutta, 1879. This book was printed from a single manuscript copy in which some texts were missing, and which cotained many errors. Such erros exist in most of the ancient Sanskrit manuscript books, and I had occasion previously, to refer to such errors. The above *Sangita-Pârijâta* is out of print, but a reprint of it, viz. *Sangita-Pârijâta* by Ahobala, edited and published by *Pandit Jivânananda Vidyâsâgara*, 2 Ramanatha Majumdar's Street, Calcutta, 1884, may still be available. Both the above books will be referred to, abbreviated as S. P.

Râga-Vibodha by Somanâtha, with latter's own commentary, edited by Purushottama Ganesa Dhârpure, Jagaddhitechchhu Press, Poona, was published in Saka 1817, *i. e.* 1895 A. D. (long after the writing of G. S. S.) by Mehr Chand Lachmandas, Sanskrit Book Depot, Lahore. This book, has been, and will be referred to hereafter abbreviated as R. V.. The date of R. V., as mentioned in its colophon, is Saka 1531, *i. e.* 1608 A. D.

Date of Sangita-Ratnakar, and of its commentary by Kallinatha. Sarangadeva, at introductory portion of S. R., has mentioned King Singhana as his king and contemporary, From mention, in Dr. Bhandarkar's "History of the Deccan", of the period of this King *Singhana*, of *Yâdava* race, of town *Devagiri*, (modern Daulatabad), of the Deccan, as 1210—1247 A. D., the editor of S. R. Poona, has deduced the date of S. R. to be, between 1210—1247 A. D., (*vide* S. R. Poona, editor's preface). Kallinatha n the introduction to his commentary, (in verses 7—8), has mentioned that *Vijaya-nripa's* (*i. e.* of King of Vijaya) offspring, Immadideva of Yâdava race, of the Karnât (*i. e.* the Deccan, or Southern India) was his king and contemporary. S. R. editor could not ascertain the exact date of this Immadideva, but from mention in R. V., by Somanatha, of Kallinatha and

the 7 *suddha* notes, only three *vikrita* notes were used, and with this total number of ten notes only, the theory of structure of all *Râgas* and other classes of practical music, was based. This, simple method was possible, as the theory of modes of those antique periods, was neither based on, nor dependent upon, any fixed positions of notes on instruments on the basis of *sa*, or of any other particular note, as was the case subsequently, as for example that found in R. V., S. P. &c., and in (as already said at p. 16 &c.), all modern Indian *thâts*. That simple method was also possible, on account of the fact, that, these **antique, as well as comparatively later** (*e. g.* those of R. V., S. P. &c.) **theories did neither recognise, nor were subservient to, any key-note,** as *sa* is the key-note, as already said (at p. 16), of all modern Indian *thâts*, and as the initial note of every modern European scale (including major and minor scales), is (as spoken of in *The Standard Course*, 5th edn. at pp. 2, 286) its key-note, or governing note. In these antique theories, heptatonic music was depicted by either different *grâmas* or different *moorchhanâs*, and the hexatonic and pentatonic types were depicted, either by one or other of these *grâmas* or *moorchhanâs*, by mention of omission of particular notes from them, or by *tânas* and although, as shown below, the initial note of a *grâma* had some intrinsic importance, and in some antique theories, by *moorchhanâ* was indicated the position of particular notes in lower, middle, or upper octaves, yet there was neither any fixed tonic of, nor any fixed position for any similar note of importance within, either a *grâma* or *moorchhanâ* or *tâna*.* These ancient theories recognised *graha*, *nyâsa*, *ansa* or

from the fact, that the *Yâdava* Kings of *Vijayanagar*, reigned from the 14th to the 16th century A. D., the editor of S. R. (*in ibid.*) has found the date of Kallinatha to be within that period. This reference by Somanatha, of Kallinatha, and also quotations from S. R. II,ii, 161, Kallinatha's commt., is to be found in, R. V. I. 34, and commt., and 41, commt..

Many other sanskrit books on music, *e. g. Sadrâgachandrodaya*, *Râgamâla*, by Pandita Pundarika Vittal, (contemporary of Akbar, and of Somanath, (see Pandit Vishnu Narain Bhatkhande's article "The Modern Hindusthani Raga system," in Report of the 4th All India Music Conference, Lucknow, Vol. II, 1925, at p. 119, and article "The Truth of Indian Music," by M. S. Ramaswami ; at *ibid.* p. 149), *Anupa Sangeeta Vilâsa*, *Anupa-sangeeta-ratnâkar*, *Anûpa Sangeetânkusa*, by Bhava Bhatta (who was in employ of king Anupa Singh, 1674-1709, Bhatkhande's article, *ibid.*, 121), *Svaramelakalânidhi* by Râmâmâtya (16th century author, M. S. R.'s article *ibid.* 149), *Chaturdandiprakâsikâ* by Vyankatesvara, (who lived in the middle of the 17th century, *ibid.*, 149) &c., have recently been published after G. S. S. author's death, which took place on 20th February 1904.

*Ancient Gramas. There were three *grâmas*,—*Shadja*, *Madhyama*, and *Gândhâra*. Of these, leaving out, *Gândhâra-grâma*, which, *Sârangadeva* says, was celestial, and not used in mundane music (S. R. I., iv, 5), the two mundane *grâmas* with *sruti* intervals between their notes, as described in S. R. (in *ibid.* 1—3), were as follows :—

Shadja-grâma :—sa 3 ri 2 ga 4 ma 4 pa 3 dha 2 ni 4 *sa*. *Madhyama-grâma* :—ma 3 *trisruti*-pa 4 dha 2 ni 4 *sa* 3 *ri* 2 *ga* 4 *ma*.

In the above, notes of middle and upper octaves, have been shown by Roman letters and by italics, respectively.

Shadja-grâma was the initial *grâma* (S. R. I. iv, 1) with seven *suddha* notes, and in *Madhyama-grâma*, pa was *vikrita*. *Dha* of the latter was termed *chatuhsruti-dha*, and was also called *vikrita* (*ibid.* I, iii, 46). This *vikrita* nomencleture (although not actually differing from *suddha-dha*) was due to its altered relationship, with neighbouring notes, from what it was with their *suddha* forms (this reason is spoken of, in connection with similar *vikrita* form of *sa* in S. R. Cal. I, ii, 38 commt.).

Says *Sârangadeva*,—*Sa* is the important note, on account of it being the initial note, and also for it having a large number of *Samvâdis* ; and *ma*, for not being omitted, is the important note, and the initial note of *Madhyama grâma* (S. R. I, iv, 6 ; *s. c.* S. R. Cal. I, iii, 6 and commts.). By samvâdi was meant the mutual (melodic) relationship between notes within which there were 12 or 8 *srutis*, *i. e.* notes which were 13 or 19 *srutis* apart, were *samvâdi* (S. R. I, iii, 50 ; *s. c.* S. R. Cal I, ii, 46, and commts.). Regarding the abovementioned importance of *sa*, commentator Sinhabhupâla (in S. R. Cal. I, iii, 6 commt.) says, that *sa* has two *samvâdis* viz. *ma* and *pa*, while the other notes have one *samvâdi* each, and thus *sa* having the largest number of *samvâdis*, is the important note (*ibid.*). By counting the *sruti* intervals between notes of both the abovementioned *grâmas*, it will be seen, however, that, besides *sa*, some other notes also, had two *samvâdis* each, *e. g. ma* had two *samvâdis ni* and *sa*, similarly *ni* had two samvâdis *ga* and *ma*. The above saying of Sarangadeva, should therefore, be understood to mean that *sa* was the important note on account of its dual merit of being the initial note, and also of it having a large number of *samvâdis*. As regards the non-omission of *ma*, spoken of above, that is found from the theory of ancient Indian systems, in which, for purpose of formation of *shâdava* (*i.e.* hexatonic) and *audava* (*i. e.* pentatonic) modes, although *sa* could be omitted, ma was never omitted (S, R. I, iv, 6 commt., 27—31 and commt., S. R. Cal. I, *iii*, 6 commt.) Thus, besides the importance of *sa* and *ma* on account of their intrinsic merits, spoken of above, these initial notes of the *grâmas* had no other importance, similar to that of the initial notes of modern scales, as key-notes.

vâdi notes, but these *ansa*, *graha* &c., notes were, in theory, especially fixed for particular *gîtas*, or particular classes of *gîtas*, such as *Râgas*, or *Jâtis*, and not for any *grâma*, *moorchhanâ* or *tâna*. In

Ancient Moorchhanas. The root *moorchh* of the word *moorchhanâ* means *moha i. e.* temporary loss of reason, and also *samuchhrâyah i. e.* extension or development. Kallinâtha, mentioning both these meanings of that root, has shown the significance of *Moorchhanâ* as—"by which agency a Râga is extended (or developed) or by which a hearer (*i. e.* audience) is made to loose sense" (*i. e.* is charmed) (S. R. Poona, I, iv, 9-12 commt.). Quoting Matanga's text, **'आरोहणावरोहै(रोह ?)ण क्रमेण स्वरसप्तकम् मूर्छना-शब्दवाच्यं हि विज्ञेयं तद्विचक्षणै'** *i. e.* "Seven notes by *krama* (*i. e.* regular) ascension and descension are indeed designable with the word *moorchhanâ* this is to be known by the sagacious. (*i. e.* wise persons)', Sinhabhupâla says, "by that Matanga's text, **स्वराणामेव मूर्छणात्वं नत्वारोहावरोहरूपायाः क्रियाया इत्युक्तं तेनैव** (*i. e.*) of notes, are *moorchhanâ* functions, not of their acts in the forms of ascension and descension, thus assuredly is spoken of by him" (*i. e.* by that text of Matanga). (S.R. Cal. I, iii, 9 commt.) "Besides above, 12 noted types of *moorchhanâs* have also been spoken of by Matanga." (*ibid.* commt.).

Moorchhanas as described by Sarangadeva. Sârangadeva has not spoken of 12-noted *moorchhanâs*, but of the type of ascents and descents of 7 notes as follows—"The ascent and descent of seven *svaras* (*i. e.* notes) through *krama* (*i. e.* in regular sequence) is termed as *Moorchhanâ*, and they are seven in each of the two *Grâmas*" (S. R. Cal, I, iii, 9; *sc.* Poona, I, iv, 9). Regarding their notes Sârangadeva says—"By middle-sa should be begun the first *moorchhanâ*, and by lower-ni and others (*i. e.* other respective lower notes) the other six *moorchhanâs* (of Shadja-grâma) successively (should be begun). Middle-ma having begun should be *Sauviri* (*i. e.* 1st of Madhyama-grama) *moorchhanâ*, and the (respective) lower and lower note to that (middle-ma) having begun (should be) the other six (*moorchhanâs* of that grâma) successively" (S. R. Cal. I, iii, 12-13; *sc.* Poona I, iv, 12-13 and commts.). About 'by middle-sa should be begun the first *moorchhanâ*' of above Sârangadeva's text, Kallinâtha says—"Whence is this assigning? Through Bharata &c. regulated property (or function) of these (is this assigning). So says Bharata—**'मध्यमस्वरेण षैंगवेण-मूर्छनानिर्देशः' इति ॥ मतङ्गोऽपि—'मध्यसप्तकेन मूर्छनानिर्देशः कार्यो मन्द्रतारसिद्ध्यर्थम्' ॥** (*i. e.*) 'by ma note *moorchhanâ*-indication (should be done) by a vinâ player,' in this manner (says Bharata). Matanga also (says)—'by middle *saptaka*, *moorchhanâ*-indication ought to be done for purpose of *Mandra* and *Tarâ* (*i. e.* lower and upper *Saptakas*) fulfilment (or accomplishment)" (*ibid.* S. R. Poona, I, iv, 12, commt.).

Saptaka (सप्तक). Mandra, Maddhya, Tara (मन्द्र, मध्य, तार). Unlike European division into lower, middle, upper &c. octaves, in the Indian system, both ancient and modern, the division is into *Mandra*, *Maddhya*, *Târa* &c. (*i. e.* lower, middle, upper &c.) *Saptakas*, and each *Saptaka* is formed of seven notes such as *sa ri ga ma pa dha ni*. These *saptakas* have been spoken of in above texts.

12-noted moorchhanas. Sârangadeva's, predecessors Matanga, Nandikesvara &c., besides speaking of the abovementioned types of *moorchhanâs* had spoken of 12-noted types of moorchhanâs also. Regarding these Kallinâtha says—,' **"मतङ्गनन्दिकेश्वरादिभिः प्रयोगे स्थानत्रयव्याप्तिसिद्ध्यर्थं लक्ष्यानुरोधेन द्वादश स्वरमूर्छना अप्युक्ताः"** (S. R. Poona I, iv, 9-12 commt.) *i. e.* "for purpose of fulfilment (or accomplishment) of extension over three *saptakas* in application (*i. e.* in application of *moorchhanâs* in practical playing), by Matanga, Nandikesvara &c., 12-noted *moorchhanâs* are also spoken of, out of regard for practice." (*ibid.* commt.). About these, Sinhabhupâla says—**मतङ्गेन तु द्वादशस्वरमूर्छना उक्ताः "इदानीं सम्प्रवक्ष्यामि द्वादशस्वरमूर्छनाः।" इति। 'अत्र मूर्छनानिर्देशः स्थानत्रितयप्राप्तये' इति वचनात् द्वादशस्वरसम्पन्ना मूर्छना द्रष्टव्याः। नन्दिकेश्वरेणापुक्तम्—'द्वादशस्वरसम्पन्ना ज्ञातव्या मूर्छना बुधैः। परिभाषा(?)दि सिद्ध्यर्थं तारमन्द्रादिसिद्धये' इति ॥ ताश्चैवम्—धनिसरिगमप धनि-सरिग—उत्तरमन्द्रा ॥१॥...इति ॥** (S. R. Cal. I, iii, 15 commt.) *i. e.* By Matanga, however, twelve-noted *moorchhanâs* are spoken of. "Now I shall duly speak of twelve-noted *moorchhanâs*," in this manner (says Matanga. Matanga also says)—"From text, 'here (*i. e.* this twelve-noted) *moorchhanâ*-indication is for getting (or extending to) three *saptakas*,' in this manner (*i. e.* from this ancient text quoted by him) *moorchhanâs* consisting of twelve notes are to be looked into. By Nandikesvara is also said—'For fulfilment (or accomplishment) of technical terminology (?) &c. (and) for fulfilment (or accomplishment) of lower, upper &c. *saptakas*, *moorchhanâs* composed of twelve notes are to be known by the learned. These are as (follows)—(here, in this Matanga's text, quoted by Sinhabhupâla, the 12-noted *moorchhanâs* with their names, are illustrated. These, transliterated are included in the illustrations of 12-noted moorchhanâs given by me, below)...". In this manner (says Matanga) (*ibid.* S. R. Cal. I. iii. 15 commt.). Both these types of *moorchhanâs* with their names as found from above texts and commentaries are as follows :—

Moorchhanas of Shadja Grama.

Serial No.	Name.	As described by Sârangadeva.	12-noted as illustrated by Matanga.
1st	*Uttaramandrâ*	srgmpdnndpmgrs	dnsrgmpdnsrg
2nd	*Rajani*	NsrgmpddpmgrsN	nsrgmpdnsrgm
3rd	*Uttarâyatâ*	DNsrgmppmgrsND	srgmpdnsrgmp
4th	*Suddhashadjâ*	PDNsrgmmgrsNDP	rgmpdnsrgmpd
5th	*Matsarikritâ*	MPDNsrggrsNDPM	gmpdnsrgmpdn
6th	*Asvakrântâ*	GMPDNsrrsNDPMG	mpdnsrgmpdns
7th	*Abhirudgatâ*	RGMPDNssNDPMGR	pdnsrgmpdnsr

periods later than S. R., this simple antique system, gave place to more and more artificial, and therefore, unnatural systems, due to more and more dependence upon instruments. These have been detailed in the

Moorchhanas of Madhyama Grama.

Serial No.	Name.	As described by Sârangadeva,	12-noted as illustrated by Matanga.
1st	*Sauviri*	mp'dnsrggrsndp'm	nsrgmp'dnsrgm
2nd	*Hârinâsva*	gmp'dnsrrsndp'mg	srgmp'dnsrgmp'
3rd	*Kalôpanatâ*	rgmp'dnssndp'mgr	rgmp'dnsrgmp'd
4th	*Suddhamadhyâ*	srgmp'dnndp'mgrs	gmp'dnsrgmp'dn
5th	*Mârgi*	Nsrgmp'ddp'mgrsN	mp'dnsrgmp'dns
6th	*Pauravi*	DNsrgmp'p'mgrsND	p'dnsrgmp'dnsr
7th	*Hrishyakâ*	P'DNsrgmmgrsNDP'	dnsrgmp'dnsrg

In the above illustrations I have used for the notes sa ri ga ma pa dha ni the letters s r g m p d n respectively, and for these notes in lower middle and upper *saptakas*, these letters in capital Roman and Italics respectively. The above illustrations of the 12-noted type, without any special signs for notes of different *saptakas*, and of the other type of *moorchhanâs* with such signs for such notes, have been taken from the illustrations of these, as quoted from Matanga in abovementioned S. R. Cal. I, iii, 15, commt., and as given by Sinhabhupâla in *ibid.* 13 commt. respectively. The special sign p' for pa of *Madhyama-grâma*, in above, is, however, mine. From the theories of the former type, in above quoted texts, it would appear, however, that the **notes of** each of these **12-noted moorchhanas, ranged over three saptakas, forming** collectively, the theoretical **range of notes of each moorchhana.**

Varieties of moorchhanas according to Sarangadeva and Matanga, Dantila &c. Sârangadeva has classified each of the seven *moorchhanâs* of both grâmas into four varieties, totalling 56 *moorchhanâs*, as follows,—(1) **Suddha-moorchhanas** *i. e.* those which included *suddha* notes only (by that word *suddha* here is meant unaltered grâma notes, including *Trisrutih* pa in madhyama-grâma. The illustrations given above, of '*moorchhanâs* as described by Sârangadeva,' are, it would be seen, of these *Suddhâ-moorchhanâs*) ; (2) those with *Kâkali i, e.* which included *Kâkali* note in place of ni ; (3) those with *Antara i. e.* which included Antara note in place of ga ; (4) those with both *Kâkali* and *Antara i. e.* which included both Kâkali and Antara notes in places of ni and ga respectively (vide S. R. Cal. I, iii, 16 ; *sc.* Poona I, iv, 17 and commts.). These two notes are spoken of below. Regarding Matanga's and Dantila's, classification otherwise, Sinhabhupâla says,—**मतङ्गदन्तिलौ तु मूर्छ्नानामन्यथा चातुर्विध्यमेवोपदिष्टवन्तौ। यदाह मतङ्गः "सप्तस्वरा मूर्छ्ना चतुर्विधा पूर्णा षाडवीता औडवीता साधारणी च" इति। "तत्र सप्तभिः स्वरैर्या गीयते सा पूर्णा। षड्भिः स्वरैर्या गीयते सा षाडवीता। पञ्चभिः स्वरैर्या गीयते सा औडवीता। काकलयन्तरैः स्वरैर्या गीयते सा साधारणी।" दन्तिलोऽप्याह "स्वरौ यावतिथौ स्यातां ग्रामयोः षड्जमध्यमौ। मूर्छ्ना तावतिथ्येव तद्ग्रामे षाडवौडवौ (?) सर्व्वास्ताः पञ्च षट् पूर्णा साधारणकृताः स्मृताः" इति। मूर्छ्नानां षाडवत्वं वक्ष्यमाणषाडवतानप्रकारेणोक्तम्। औडवत्वं वक्ष्यमाणौडवतानप्रकारेणोक्तम्।**...(S. R. Cal. I, iii, 19 commt.) *i. e.* "Both Matanga and Dantila had otherwise spoken of the quadruple (varieties) of *moorchhanâs*, So says Matanga—'**7-noted moorchhna** (is) of four sorts, (1) *Purnâ*, (2) *Shâdavitâ*, (3) *Audavitâ*, and (4) *Sâdhârani*. There (*i. e.* of these) what is sung with seven *svaras* (*i. e.* notes, or tones) is Purnâ, what is sung with six svaras is Shâdavitâ, what is sung with five svaras is Audavitâ, what is sung with notes which include Kâkali and Antara is Sâdhârani', Dantila also says—(here Dantila's texts which speak of similar four classifications, and also of,—that moorchhanâ of Shadja-grâma, being the 1st or 2nd or 3rd &c. of that grâma, amongst the notes of which sa is the 1st or 2nd or 3rd &c. note respectively, and similarly of ma note amongst moorchhanâs of Madhyama-grâma, is quoted here. There are, however obvious errors in the readings of that text here), in this manner (says Dantila. Thereafter Sinhabhupâla adds). *Shâdava* function (*i. e.* Shâdava class) of *moorchhanâs* is spoken of (by Sârangadeva) in the form of *Shâdava Tânas* intended to be spoken of (afterwards by him), *Audava* function (of *moorchhanâs*), is spoken of in the form of *Audava Tânas* intended to be spoken (of by him afterwards)..." (*ibid.* S. R. Cal. commt. Sârangadeva has not mentioned the above four classifications of *moorchhanâs*, and the Shâdava and Audava classes amongst these have been spoken of by him in the form of Shâdava and Audava Tânas, respectively, says Sinhabhupâla in above commt. The abovementioned **KAKALI** and **ANTARA** were *vikrita* notes, two *srutis* above ni and ga respectively.

Ancient TANA(तान)s. Says Sârangadeva—**"तानाः स्युर्मूर्छ्नाः शुद्धाः षाडवौडुवितीकृताः॥"** *i. e.* "*Suddhâ-moorchhanâs* made into *Shâdava* and *Audava* would be *Tânas*." (S. R. Poona I, iv, 37). Sârangadeva has described *moorchhanâs*, as spoken above, as being of 7 notes in ascent and descent. That may lead to the view that the above *Tânas* were of 6 or 5 notes in ascent followed by their descent. I shall speak of this hereafter. To distinguish them from *Kuta-Tânas*, these *Tânas* were also termed *Suddha-Tânas*, and Kallinâtha (in *ibid.* commt.) has so termed them. Sinhabhupâla, as shown above, has spoken of these types of *Tânas* as the forms in which Sârangadeva had spoken of *Shâdava* and *Audava* classifications of *moorchhanâs*. Sârangadeva, however, has not, in the theories of *Jâtis*, *Râgas* &c. mentioned any *Tâna* of them, but for the *Shâdava* and *Audava i. e.* hexatonic and pentatonic types of these, he has mentioned the particular one or two notes omissions in them, from the particular *grâma* or *moorchhanâ* of each of these. Explanation of such and similar other apparent superfluities, redundancies, inconsistencies and divergences in S. R. may be had from the fact that Sârangadeva, as he says, had **"in Sangita-Ratnakar embodied in condensed form** materials collected from **the writings of various (more) ancient authors** including *Sadâsiva*, *Sivâ*, *Brahmâ*... *Matanga*...*Bharata*...*Dantila*...*Anjancya &c.*, the sea of whose writings and opinions had (then) been very difficult to fathom..." (vide S. R. Poona I, i, 15-20.).

Parisishta *i. e.* Appendix (in Bengali) **to Vol. I of Gita Sutra Sar,** written by me and published recently, (in 1934 together with that Vol, I and part first of Vol. II of Gita Sutra Sar). I have spoken there in detail about this antique system, and its gradual change from comparatively less to greater and greater subordination to musical instruments, and the artificial notes and artificial modes, *melas, thâts* and scales that followed as a result of that subordination. I shall speak here very briefly, what I have spoken in detail in that *Parisishta,* regarding the theory and practical playing in instruments of *graha, ansa* or *vâdi, nyâsa* &c. notes in those antique periods, and shall also recapitulate in that connection what I have already spoken before (in this Expl. and Notes), on the subject. For further details and for further quotations from ancient Sanskrit texts in support of these conclusions of mine, the abovementioned *Parisishta** should be referred to.

These *graha* &c. notes, and the *grâmas* or *moorchhanâs* to which these notes were aloted, were the parts and parcels of the grammar of *Mârga Sangita i. e. Sangita* of celestial origin. *Sangita* (सङ्गीत) included the three items, *gita* (गीत), *vâdya* (वाद्य) and *nritya* (नृत्य, also spelled *nritta*, नृत्त).† **The rules of grammar of MARGA-SANGITA were enjoined to be very strictly observed.**‡ It was so ordained that, in practical performance of a *mârga-sangita*, strict adherance to its rules of grammar, including that of the *Jâti* (*i. e.* class) or *Janaka* (*i. e.* parent) *Râgâ* to which it belonged, had the effect of *adrishtaphalalâbhah* (अदृष्टफललाभः) § in addition to the *drishtaphalalâbhah* (दृष्टफललाभः) *i. e.* attainment of object immediately perceived, *viz.* that of entertaining, while any departure from these rules in course of performance, had the effect of *pratyavâyah* (प्रत्यवायः) *i. e.* offence or sin‖. **For Desi-Sangita** including *Desi-Râgas,* **there were no such hard and fast injunctions for** its strict addherance to **the rules of grammar¶.** *Matanga,* in *Brhaddesi* (बृहद्देशी)** following anterior

* This *Parisishta*, similar to Vol. I, and First Part of Vol. II of Gita Sutra Sar, is in Bengali, but the quotations of sanskrit texts in that Parisishta are mostly in Devanagara characters.

† S. R. Poona, I, i, 21 and commt.. Of these three, *gita*, which has been explained before by me (at p. 35 notes), included both vocal and instrumental melody (S. R. VI, 3—4 commt.), *vâdya* signified instrumental music including that of instruments of drumming, cymbals &c. (*ibid.*), *nritya* or *nritta* signified dancing and poses, postures, movements of different parts of the body &c. for that, or similar purposes (S. R. VII, 15, 16, 28—39).

‡ Besides the affixing of particular *grâma, moorchhanâ*, &c., *graha, ansa* &c. notes &c. to a particular *Mârga-Sangita*, the rules of grammar of that *sangita* also included, rigidly affixing, a particular rhythm (as spoken of before by me at p. 77 notes *et seq.*), or *Tâl*, and particular part of the day or night and particular part of a drama &c. for purpose of performance, and the classification of that *sangita* into different *Jâtis* and into *Janaka* (*i. e.* parent) and *Janya* (*i. e.* offspring) Râgas and the strict enjoinment for adhering to the grammar of the *Jâti* or *Janaka* to which a particular *mârga-sangita* belonged, and also, the allotment of particular *suddha* and *vikrita swaras* and particular *srutis* to these *swaras* &c..

§ *i. e.* attainment of object not immediately realised *viz.* attainment of *sreyah* or *abhyudaya* or *kalyâna* (S. R. Poona I, *i*, 22—23; I, iv, 90 and commt.; I, vii, 112—113 and commt.; I, viii, 10; II, ii, 161 commt., near end; V, 42, 198 and commts. &c.). The abovementioned *abhyudaya* and *kalyâna* are included within the abovementioned *sreyah*. By this *sreyah* is meant final happiness or weal or prosperity or liberation.

‖ S. R. Poona, I, vii, 112—113 and commt..

¶ Adherance to the antique rules of grammar, says *Kallinâtha* in performing a *desi-sangita*, had the effect of greater *adrishtaphalalâbha* than by not strictly observing these rules, but the latter did not bring about any *pratyabâyah*, and departure from its rules of grammar in performing a *desi-sangita* might result only in the *drishtaphalalâbhah* of that being unentertaining (S. R. VI, 334—336 and commt.). About **DESI-RAGAS** says *Hanumat* :—

"येषां श्रुतिस्वरग्रामजात्यादिनियमो न हि ।
नानादेशगतिष्ठाया देशीरागास्तु ते स्मृताः ॥" (Text of *Hanumat* quoted in R. V. I, 35 commt.).

The same text with slight modifications in its reading, has been quoted as text of *Ajaneya* in S. R. II, ii, 161 commt.. Clearly, that reading *Ajaneya*, is incorrect. That should be *Anjaneya* (आञ्जनेय, the same author as mentioned in S. R. I. *i*, 15-20, as spoken of before by me at p. 84 notes, near bottom, of this Expt, and Notes) *i. e.* son of *Anjanâ, i. e. Hanumat.*

The above text of *Hanumat* about **DESI-RAGAS**, says,—"Those Ragas that are not bound by the rules of *sruti, swara grâma, jati* &c. and which exist in divurgent forms in different localities, are known as *Desi—Râgas.*"

** *Brhaddesi* by *Matangamuni* pp. 154, Trivandrum Sanskrit Series, published by the Government of Travancore, 1928. I have been able to procure this book recently (in 1934), after the printing of the *Parisishta* to Vol. I of G. S. S. previously spoken of, and of the pages up to 84 of this Expl. & Notes. India is a big country, and people of one part of it are often unaware of what is

authorities, and Sarangadeva in S. R. following his anterior authorities including Matanga, have given the ancient theories of classifications of different *grâmas*, *moorchhanâs* and *tânas* and also of the classifications of Ragas as belonging to, or being *Janyas* (*i. e.* offsprings) of, a *Jâti*, and of these Ragas and others being classed as independent Ragas, or as *Janaka* (*i. e.* parent) Ragas or *Janya* (*i. e.* offspring) Ragas and both these authors have alloted, by either general or special rules, either a *grâma* or a *moorchhanâ* or both, to each *Jâti*, and also a *moorchhanâ* and in some cases a *grâma* to most of the Ragas that have not been classed as a *Janya* to a *Janaka Râga*. Both these authors have mentioned many Ragas of both *mârga* and *desi* classes, and they have given the theories of many of them, and practical examples, in ancient notation, of some of them. In these theories of these Ragas they have alloted to each of these Ragas, and in the theories of *Jâtis* they have alloted to each *Jâti*, particular *graha*, *ansa*

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going on in a distant other part. By consulting this printed Matanga, I found that my inferences about the misquotations in S. R. Poona I, *iii*, 51-52 commt., as told by me before (at p. 78 notes at bottom), and also about the above and similar misquotations from *Matanga* in S. R. Cal. I, ii, 45-47 commt., as spoken of by me at Ch. VII, p. 463 of the abovementioned *Parisishta* (regarding replacing of a note by its *samvâdi* or *anuvâdi* or *vivâdi* note), are quite correct. These actual texts of Matanga, as are to be found at pp. 14 15 of the above printed *Brhaddesi* by Matanga, are exactly as I had suggested in the abovementioned writings of mine.

This printed *Matanga* is also not free from errors and omissions. It was printed (as told by its learned Editor, in his Preface), from two incomplete palm-leaf manuscript copies, which were full of errors and omissions. On reading this printed book, I found that besides these errors and omissions, many of the texts have been juxtaposed in wrong places. *e. g.* the proper position of lines 8-14 dealing with *Mâgadhi*, *Ardhamâgadhi* &c. *Gitis* at p. 49 of this book, seems to be, after line 16 of that page, and the proper position of line 7 of that page seems to be near about line 12 of p. 50. Similarly, the last three lines of p. 37 and the following ten lines at the next page, dealing with *moorchhanâs*, seem to be quite out of place and their proper position seems to be near p. 22, These misplacings of texts might have been due to the misplacings of the palm-leafs of the abovementioned original or their previous original manuscript copies.

Such errors, omissions &c. are to be found more or less in every ancient Sanskrit book on *Sangita*, *e. g.* S. R., S. P. &c., and these are the greater, the older the book is. These, and besides these, the divurgences in the readings in the available manuscript copies of *Bharata's Nâtya Sâstra* with *Abhinavagupta's* commentary are so great, says the Editor, in his Preface to the printed Chs. I—VII of that book and commt. (Gaekwad's Oriental Series, Central Library, Baroda, 1926), that often two *Mss.* are unidentifiable to be from the same original. These errors,, omissions, divurgences of readings, and misplacings of texts &c. add to the difficulty of understanding these ancient books which, dealing as they have done, with many theories, technical terms and practices, which have long become obsolete, are otherwise also very abstruse and difficult at many places. Much of these errors and omissions may be corrected, and these books may more clearly be understood, by the following method :—

Bharata and other authors have been freely quoted by *Dattila*. *Matanga* has freely quoted and taken materials from *Bharata*, *Dattila* and others. Sârangadeva in S. R., and *Sangitâkara Sri Pârsvadeva* in *Sangitasamayasâra*, have freely drawn materials from anterior authorities of theirs, including Bharata and Matanga. Sârangadeva has specifically mentioned *Brhaddesi* in S. R. II, i, 42; *Sinhabhupâla* and *Kallinâtha*, the commentators of S. R., have freely quoted from *Bharata*, *Dattila* (spelled as *Dantila*), *Matanga* (including some of Matanga's quotations from Bharata, Dattila &c.) &c., and *Sinhabhupâla* has also quoted from *Sangitasamayasâra*. Besides these, in both these commentaries of S. R., portions and fragments of texts of S. R. have been quoted in the commts. to these, or other related texts. *Sômanâtha* in R. V. and its ommt. has taken materials from S. R. and has also quoted from Bharata, Matanga, S. R., Kallinâtha's commentary of S. R. &c.. Sinhabhupâla in S. R. Cal. I, i, 2 commt. and Somanâtha in R. V. I, 7 commt. have specifically mentioned *Brhaddesi* by *Matanga*. The abovementioned *Dattila* (by Dattila-Muni, pp. 24), and *Sangitasamayasâra* (by *Sangitâkara Sri Pârsvadeva* pp. 96), have been printed in the Trivandrum Sanskrit series and published by the Government of Travancore, in 1930 and 1925 respectively. The above author *Dattila* (दत्तिल) has been spelled, in S. R. Cal. commt. and S. R. Poona commt. (as spoken above)), as *Dantila* (दन्तिल). Sârangadeva has also mentioned *Dantila* (in S. R. Poona I, i, 16) amongst his predecessors. Both these printed *Dattila* and *Sangitasamayasâra*, carry with them the errors and omissions (which are many) of their original manuscript copies. From the abovementioned and also other printed or (when available for reference) manscript books of different ancient periods, by comparing their texts which deal with the same or related subjects, and also by comparing the different readings of an original or quoted text with the quotation of that text in different parts of the same book or in its commentary, or in books of subsequent periods and their commts., many of the errors and omissions of each of these books may be corrected, and much light may also thus be thrown on many of their abstruse passages.

I may mention here, that S. R. Cal. I, *iii*, 15 commt. contains quotations from the texts as well as from a commentary named *Tavaka* (तावक) of *Dantila*. These texts, with some differences in their readings, are to be found at pp. 2-3 and of the above printed Dattila, but the latter book contains texts only, and no commentary of Dattila. I may also mention here that

or *vâdi, nyâsa* &c. notes, and they have also mentioned in these theories, *alpatva, bahutva,* omission &c. of particular notes, &c. In the abovementioned classification into *Jâtis*, and *Janaka* and *Janya* Ragas, and allotment of *grâma, moorchhanâ, graha, ansa* or *vâdi, nyâsa* &c. notes, both these authors had, no doubt, followed the grammar of *Mârga Sangita*, some of the systems, rules and practices of which, were no doubt current in their times.

The prescription by the *Vedas* and other infallible or authentic texts, of *grâmas, moorchhanâs* and *tânas* have been spoken of by *Matanga* and *Sârangadeva* in the texts of theirs quoted below.* Matanga,also speaks of *grâmas* being differentiating factors of *Jâtis* and *Râgas*, and *suddha-tânas* being differentiating factors of *Jâtis* and *Râgas* of the two *grâmas*, and *moorchhanâs* being suitable in all *Jâtis* and *Râgas*, in the texts quoted below.† The abovementioned and similar other sayings of Matanga and Sarangadeva

the quotations from *Sangitasamayasâra* by Sinhabhupâla as appear in S. R. Cal. I, *ii*, 7. 10, 12, 23 commts. (relating to *swaras* and *srutis*) and in *ibid.* I, *iii*, 1 commt. (relating to *grâma*), and in *ibid.* I, *iii*, 82 commt. (relating to *tânas*) are not to be found in the above printed *Sangitasamayasâra*. This may be due, either to the two books being different, or to the latter being incomplete.

* *Matanga*, in the general and special theories of those Râgas, that have been classed by him as not being offsprings of other Râgas, has allotted particular *grâmas* to each and particular *moorchhanâs* to most of these Râgas. In justification of this allotting of *grâmas* and *moorchhanâs* to these Ragas he says :—

ननु एते ग्रामविशेषसम्बन्धाः कुतोऽयं विशेषलाभः। उच्यते। भरतवचनादेवासौ विशेषो लभ्यते। तथाचाह भरतमुनिः—"जाति-सम्भूतत्वाद् ग्रामरागाणाम्" इति। "यत् किञ्चिदेतद् गीयते लोके तत् सर्व्वजातिषु स्थितम्" इति वचनात्। (*Brhaddesi* by *Matanga-Muni*, p. 87). "ननु: पूर्व्वोक्तानां रागाणां मूर्छनाविशेषनिर्देशः कस्माज्ज्ञायत इति चेदुच्यते। आप्तवचनान्मूर्छना-विज्ञायते। तथा चाऽऽह कश्यपः—'ज्ञात्वा जात्यंशबाहुल्यं निर्देश्या मूर्छना बुधैः' इति।" (Text of *Matanga* quoted in S. R. Poona II, *ii*, 31 commt. at pp. 164—165. This text with the following differences in its reading, is to be found in *Brhaddesi*) :— ".....क्तानां मूर्छनावि.....इति। उच्यते (आप्तवचनाद्) मूर्छनाविशेषो ज्ञायते। तथाचाह काश्यपः—'ज्ञात्वा.....बुधै।" (*Brhaddesi* p. 103. The portion within brackets is that suggested by the editor of this printed *Brhaddesi*). Regarding prescription of *Moorchhanâs* and *tânas*, Sarangadeva says,—गान्धर्वे मूर्छनास्तानाः श्रेयसे श्रुतिचोदिताः॥ S. R. Poona I, *iv*, 1st line of verse 90). *i.e.* "*Moorchhanâs* and *Tânas*" *i.e.* (*i.e. sudhâ moorchhanâs and suddha tânas, ibid.* Poona and Cal. comnts. not quoted above) "are prescribed in the *Vedas* for *Gândharva* (*i.e.* for *mârga gita, ibid* commts., or music of celestial origin, S. R. IV, 2-3) "for the sake of *sreyah*" *i.e.* for final happiness, or weal or prosperity or liberation.)

I shall now give a free translation and explanation of above *Matanga's* texts :—

"Question.—These relationships of particular *grâmas*" (of particular Râgas mentioned before), "how is this particularity attained? Answer,—from the saying of *Bharata* indeed, is this particularity attained. Thus (*i.e.* in that manner) also said Bharata-Muni, 'From the birth (*i.e.* originating) of *Grâma-Râgas*, from *Jatis*'. In this manner. (Of) 'this' (*i.e.* the *gitas* spoken of before by the author of this quoted text) 'whatever is sung amongst people, that, lies within all *jâtis*' (i.e. that is within one or more *jâti*). From this text." (*Brhaddesi*, p. 87). The portions within brackets, in the above, are the explanations of mine. The *Grâma-Râgas*, as spoken of in the above Matanga's quotations from Bharata, have been included by Matanga (in *Brhaddesi* at p. 104 *et seq.*) and by Sârangadeva (in S. R. II, *i*, 2—14, and subsequently in the theories of each) within one, amongst different other classifications, of *Mârga-Râgas* by different more ancient authorities, and both Matanga and Sârangageva have detailed the ancient theory of origin of each of these *Grâma-Râgas* from one or more *Jâtis*, and both have alloted, from ancient theory, either *sadja* or *madhyama grâma* to each of these *Grâma-Râgas*.

In the next text of *Matanga*, quoted above, he says,—"If it is said, from what does the specifying of particular *moorchhanâs* to the above-spoken Râgas originate? The answer is,—from infallible sayings (or texts of *Vedas*) are the *moorchhanâs* known. Thus also spake *Kasyapa*,—'Knowing' (*i.e.* being cognisant of), '*Jâti, ansa*' (*i.e. ansa* note), 'property of *bahula*' (*i.e., bahutva* of notes), '*moorchhanâs* are to be specified' (to *gitas* or Râgas) 'by the learned.' In this manner." (*Brhaddesi* p. 103, and quotation of same in S. R. II, ii, 31 commt. at pp. 164—165, quoted above).

† प्रामाण्यत्वाज्जातिरागान्यत्वम् (*Brhaddesi*, at p. 21). ननु मूर्छनास्तावत् जातिरागेषूपयोगिन्य इति युक्तं तासां कथनम्। तानास्तु कुतोपयुज्यन्ते। उच्यते। द्वयोर्ग्रामयोर्जातिरागान्यत्वप्रतिपादनार्थं प्रयोगस्तानानाम्। यद्वा नष्टोत्पन्न (नष्टोद्दि)ष्ट संख्या—सिद्ध्यर्थं प्रयोगस्तानानाम्। (*Brhaddesi*, at p. 30. The portion within brackets in the above text, is the correction of an obvious error, suggested by me.)

In the first of the above texts, Matanga says —"From diversity of *Grâmas*, difference amongst *Jâtis* and *Râgas*" (occurs), *i.e. grâmas* are differentiating factors of different *Jâtis* and *Râgas*. (*Brhaddesi*, p. 21). In the next text

and the manner in which both have prescribed *grâmas* and *moorchhanâs* in the theories of different *Jâtis* and *Ragas*, lead to the view, that the use of *grâmas, moorchhanâs* and *suddha tânas* in Indian music of very antique periods, was similar to that of ancient Greek and Eccelsistical modes. * Unlike, however, particular lowest, final, dominant &c. notes being attached to particular modes, as was, as spoken of by modern European writers,† the case with these ancient Greek and ancient European Ecclesiastical modes, and unlike the inital note being the key-note of, or any key-note being attached to, any of these ancient Indian modes, as is the case with modern European scales and Indian *thats*, in the ancient Indian theory of allotting *graha, ansa* or *vádi, nyâsa* &c. notes already spoken of at pp. 86-87), these particular *graha* &c.

quoted above, *Matanga* says,—"Question.—*Moorchhanâs* are suitable for all" (sorts of) "*Jâtis* and *Râgas*. This saying of theirs" (*i.e.* of ancient authorities) "is reasonable. For what then, *tânas*" (*i.e. suddha-tânas*) "are suitable? Answer, for giving effect to the differenciation of *Jâtis* and *Râgas* of the two" (*i.e. sadja* and *madhyama*) "*grâmas*, is the application of *tânas*, or that, for establishing *Nashta Uddishta* numbers is the application of *tânas*." (*Brhaddesi*, p. 30). Either *sadja* or *madhyama grâma* has been allotted by *Matanga*,to each of the *Jâtis* and *Râgas* referred to in the above Matanga's text, and along with heptatonic, the hexatonic and pentatonic varieties of *gitas* also, have been included by Matanga (and similarly by Sârangadeva in S. R.), within some of these *Jâtis*, and *Râgas*. The above "differenciation of *Jatis* and *Râgas*" of the above text, seems to refer to the differenciation of the abovementioned hexatonic and pentatonic varieties of particular *Jatis* and *Râgas*, by means of *suddha tânas*, each of which *tânas* (as spoken before by me) was composed of six or five notes. This leads us to the view, that the application of different *grâmas, moorchhanâs* and *tânas*, spoken of in the above texts of *Matanga*, was similar to that of ancient Greek and ancient European Ecclesiastical modes.

The above "*Nashta Uddishta* numbers" of the above *Matanga's* text, as can be seen from the next text of his (which has not been quoted above, refers to the calculation of the numbers of *Kuta-tânas* by the ancient *Nashta* and *Uddishta* process (which process has been spoken of before by me at p. 69 notes). Sârangadeva in S. R. Poona I, *iv*, 32—70, *sc.* S. R. Cal. I, *iii*. 31—67, has shown and in the respective commentaries to these texts, his commentators. *Kallinâtha* and *Sinhabhupâla* have more clearly shown, the calculation of the number of *Kuta-tânas*, by the above ancient *Nashta* and *Uddishta* process, and *suddha-tânas*, not so termed but mentioned as *Krama* (*i.e.* regular) sequences of six as well as five notes, have been taken account of in these calculations. "*Nashta Uddishta* numbers" spoken of in above Matanga's texts, refers to similar use of *suddha-tâna* numbers for similar purposes.

*Matanga and Sârangadeva have not mentioned in the special theories of some *janya* Ragas, the *grâmas* or *moorchanâs* of these Râgas. These and other Râgas, which were *janyas* either from *Jâtis* or from *janakâ Râgas*, embodied, excepting those items that were especially mentioned in their special theories, all the other items of their *janaka* (*i.e.* parent) *Jâtis* or *Rágas*, including *grâma, moorchhanâ, graha, ansa* &c. notes, &c. (S. R. Poona I, vii, 112—113 ; and II, ii, 70—71 commt. *re Mâlavakaisika Râga*). Both Matanga and Sârangadeva have indicated *Shâdava* and *Audava i.e.* hexatonic and pentatonic types, by mention, in their special theories, the particular one or two notes that were omitted in them, from the *grâmas* or *moorchhanâs* of the general or parent class of *Jâtis* or *Râgas* from which these types originated. Both these authors have, however, not indicated any of these *Shâdavas* or *Audavas* by any *suddha-tâna*. Kallinâtha, nevertheless has done so in case of some *Audavas* of S. R.,—*e.g.* he has spoken of *ri-pa*-omitted *suddha-tânna* of *Suddhakaisikamadhyama Râga* in S. R. II, ii, 31 commt. at p. 162 bottom, and of *ni-ga*-omitted *tâna* of *Takkakaisika Râga* in *ibid.* p. 163 bottom, and of *ri-dha*—omitted *tâna* of *Hindôla Râga* in *ibid.* p. 164 top. The *shâdava* and *audava* types indicated by mention in S R., of omission of one or two notes, as spoken above, included both *suddha* and *vikrita* notes. A **SUDHA-TANA**, however **included only suddha notes**, as a *Suddha-tâna*, as spoken of by Sârangadeva, was, "*Suddha* (variety of) *moorchhanâ*, made *Shâdava* or *Audava*" (S. R. Poona I, iv, 27), and the *Suddhâ Moorchanâs* were as spoken before (at p. 84 notes) composed of shudha notes only.

7-noted-MOORCHHANAS and 6 or 5-noted SUDDHA-TANAS. From the abovementioned S. R. text, I deduced, and described before, (at p. 84 notes) *suddha-tânas* as regular ascents of 6 or 5 notes followed by regular descents of the same notes. Neither Matanga nor Sârangadeva has, however, anywhere described *sudha-tânas* exactly in that way, nor has Sârangadeva anywhere described *moorchanâs* as being composed of 7 notes. Kallinâtha, as shown above, has spoken of pentatones as *sudha-tâna* or mererly *tâna*. Similar to that described in S. R., Matanga has said,—"seven notes in regular ascent and descent are called *moorchhanâ*" (Brhaddesi p. 22) but while differentiating that, from 12-noted *moorchhanâs* he has described the former as 7-noted *moorchhanâs* (in *ibid*). While distinguishing *moorchhanâs* from *Sudha-Tanâs*, Matanga, in the following text of his, has spoken of the former being composed of notes in ascent and descent in regular sequence, and the latter being composed of notes in regular ascent—"ननु मूर्छना—तानयोः को भेदः? ब्रूमः। आरोहावरोहक्रमयुक्तः स्वरसमूहादयो मूर्छनेत्युच्यते, तानस्तु आरोहक्रमेण भवतीति भेदः।" (Text of Matarga, quoted in S. R. Cal. I, iii, 19 commt. Of the "ब्रूमः.....भवतीति भेदः।" portion of the above text, the reading in Brhaddesi, at p. 26 is "मूर्छनारोहक्रमेण तानोऽवरोहक्रमेण भवतीति भेदः।" Obviously the later reading is incorrect. From this text we get *suddha tânas* as being composed of either 6 or 5 notes. The 14, 7, or 12-noted forms of *moorchhanâs* as described by each ancient authority, were, thus, suited to the particular theory and particular purpose for which, each of these were meant to be applicable.

†*e.g.* in Encyclopædia Brittanica, and by Mr. Clements in his 'Intro. To Ind., Music', at IV, 61, and by Mr. Fox Strangways in his 'Music Of Hindostan,' at VI, 178—179.

notes were not attached to particular *grâmas* or *moorchhanâs*, but, as is to be found from Brhaddesi and S. R., in these antique periods, in India, in the general or special theory either of a *gita*, or of the *gitas* of a class, *e.g.* that of a *Râga* or *Jâti* &c. or of the *Janaka Râga* or *Jâti* of these, it was detailed, which particular notes (amongst the group or galaxy of notes which a *gita*, as spoken before at p. 35 notes, was composed of) of the *grâma* or *moorchhanâ* of that *gita* or of the *gitas* of that class, functioned as *graha*, *ansa* or *vâdi*, *nyâsa* &c. notes, and which notes were *alpa* or *bahula* or *suddha* or *vikrita* or omitted &c. The ancient theory of composition of *gita* (as spoken before at p. 35 notes) was based on this system.

In that ancient system, so far as can be gathered from some S. R. and more ancient texts, a few examples of which are given below, besides the abovementioned use similar to that of modes, *moorchhanâs* and *tânas* were applied as ornamental phrases, or as graces and ornaments also, in some cases, especially in *Desi* music. *

Both **MOORCHHANA and TANA signify, in modern Indian Music, only ornamental phrases and similar embellishments,** with no particular notes or sequences of notes being affixed to any of them. From what he could gather from the ancient Sanskrit books on music that were available to him, the **author of Gita Sutra Sar understood MOORCHHANA in the sense of mode** of seven consecutive notes, beginning with a particular initial note, similar to ancient Indian *moorchhanâ*, and Greek and ancient European mode, (as explained before), **but** unlike these, **the initial note of each moorchhana, as that author understood it, was its key-note, wtih no other importance being affixed to any other note** of each *moorchhanâ*. **Besides** the abovementioned **heptatonic** forms, the author of G. S. S. has given the theories, as shown before (at pp. 14, 19—20 &c.) of **SHADAVA and AUDAVA types, as well as VIKRITA forms of these moorchhanas** also, all of which that **author understood and practically applied** in G. S. S. Vols. I and II, **in the abovementioned sense.** The **moorchhanas** that have been used **in the examples of music in** (this) **Vol. II, should be understood to bear that meaning.**

* गान्धर्व्वे मूर्च्छनास्तानाः श्रेयसे श्रुतिचोदिताः॥ गाने स्थानस्य लाभेन ते कूटाश्चोपयोगिनः॥ (S. R. Cal I. iii, 82) मूर्च्छनास्तानाश्च गान्धर्व्वे मार्गगाने श्रुतिचोदिताः श्रुत्या विहिताः। श्रेयसे अभ्युदयाय निःश्रेयसार्थम्। अतश्च शुद्ध-मूर्च्छनातानादिप्रयोगस्य धर्मत्वमपि सूच्यते। यतोऽभ्युदयश्रेयससिद्धिः स धर्म्म इत्यङ्गीकारात्। गाने देशीगाने ते शुद्ध-मूर्च्छनास्तानाः कूटतानाश्च स्थानलाभेन रञ्जकस्थानविशेषलाभेन उपयोगिनो भवन्ति। अथवा मन्द्रमध्यतारादिस्थान प्राप्तये उपयोगिनो भवन्ति।·····S. R. Cal. 1, iii, 82 commt.). The first line of the above text, as already explained (at p. 87 note), says that "*moorchhanâs* and *suddha-tânas* are prescribed in the *Vedas* for *Gândharva* (*i.e. Mârga* music) for purpose of *sreyah i.e.* final happiness &c." The next line of the above text, as explained by the above commt., says, "In *gâna* (*i.e.* in *desi-gitas*) by attaining proper positions, these two (*i.e. moorchhanâs* and *suddha-tânas*) and also *Kuta-tânas*, become suitable." *Kuta-tânas*, have been explained before (at pp. 69 & 84 notes). "Proper position" of above text is explained by Sinha-bhupâla in above commt. as,—"getting at particular position suitable for entertaining, or (that may mean), getting at positions of upper, middle, lower &c. octaves." The above text as explained by above commt. seems to speak of the application of *moorchhanâs* and *tânas* in *desi-music*, as graces or embellishments or as ornamental phrases.

Ancient *Prabandhas*, as already spoken of (at p. 67 and notes) were various types of *desi* human compositions (S. R. IV, 3—6 and commt.). Amongst the theories of several types of these *Prabandhas*, Sârangadeva has spoken of '*Alpa-moorchhanâ* (अल्प मूर्च्छना, in S. R. IV, 48) and "*Moorchhanâ-Kômalatva*" (मूर्च्छना कोमलत्वः *i.e.* mildness or tenderness or softness of *moorchhanâ*, in *ibid.* 50) as being some, amongst other general characteristics of *Elâ* (vide *ibid.* 22—23, 33—50 and commts.) class of *Prabandhas*. *Kallinâtha* explains the above '*Alpa-moorchhanâ* as follows:—"मूर्च्छनाया अल्पत्वं तानीकरणाद्भवति। तानीकरणं नाम पूर्वमतानस्य तानत्वसंपादनम्। तच्च तानादिमं स्वरमुच्चार्याऽऽरोहेण वाऽवरोहेण वा क्रमेण मध्यस्थितानां स्वराणां स्पर्शमात्रेणातीत स्वरोच्चारणे सति भवतीति मन्तव्यम्।" (S. R. IV, 48 commt.) *i.e.* "*Alpa*-property of *moorchhanâ* occurs from *Tânikarana*. Accomplishing *tânatva* (*i.e. tâna* property) of previous non-*tâna* is called *Tânikarana*. That takes place, when, after the uttering of the first note of a *tâna*, by merely touching the intermediate notes (or tones) in ascending or descending order, (there-after) the first note is uttered." This *Tânikarana* seems to signify particular types of graces or embellishments or ornamental phrases.

Amongst several sorts of right-handed, left-handed, and both-handed play of graces and embellishments, on the *Ekatantri* (*i.e.* one-stringed) *Vinâ* (vide S. R. VI, 29—30, 107—108 and commts. and notes bet. them), each of which sorts bore a technical name, and which, as far as practiable were applicable to other kinds of *vinâs*, (vide *ibid.* 173—174,

The ancient theory of different *grâmas* and *moorchhanâs*, and of *graha*, *ansa*, *nyâsa* &c. notes, were the parts and parcels of the system of tuning and playing *Gitas*, *Râgas* &c. on instruments in those ancient periods. The **ancient instruments for playing GITAS (and** necessarily **RAGAS) were** stringed instruments of various types termed by the general name **VINA, and flute instruments** (S. R. VI, 3-6 and commt.), **the principal of which** latter, as found from their descriptions in S. R. Ch. VI **was VANSA (वंश)** * Regarding *vinâs* Sârangadeva mentions (in S. R. Ch. VI), the tuning of their strings on the basis of *sa* or *sa* and *ma*, or of some unnamed initial note and for consecutive notes on that basis, and for *vansas* he has given different versions of theoretical measurements of different sized *vansas*, tuned to different sets of consecutive notes, based on an initial note of either lower or middle or upper octave.† **In** actual practice, however, of these, and more **ancient periods,** particular named **notes were not invariably produced from the positions alloted to them at the time of tuning of** these **VINAS and VANSAS, but,** as far as can be gathered from S. R. and its anterior texts, we find that in actual practice, **suiting different GITAS or** classes of *gitas* such as **RAGAS or JATIS,** to which different *grâmas* or *moorchhanâs* or *graha*, *ansa* (or *vâdi*), or *nyâsa* &c. notes were theoretically alloted, particular notes were **also** produced

and plays of the latter also were, as far as practicable applicable to the former, *ibid.*), Sârangadeva has described a both-handed (vide *ibid.* 66—69, and notes bet. 87—88) **play on strings, termed MOORCHHANA,** as follows,—**उद्वेष्टपरिवर्ताभ्यां तन्त्र्यां भ्राम्यति दक्षिणे। स्वरस्थाने द्रुतं कम्रासारणं मूर्छना मता॥** (S. R VI, 84) *i.e.* "Quick *sâranâ* of *kamrâ*" (on the string by the left hand, vide both-handed play spoken above) "in positions of notes, while the right hand is moving (*i.e.* striking the string) "by *udveshta*" (*i.e.* by straightening the bent fingers, from the forefinger to the little finger consecutively, vide S. R. VII, 543—548) and *parivarta*" (*i.e.* in course of straightening the bent fingers, from the little finger to the forefinger consecutively, vide *idid.*) is called *Moorchhanâ.*" Of the abovementioned two technical terms *sâranâ* and *kamrâ*,—*sâranâ* signified moving, or rubbing, or gliding on, or stopping the string with the finger or with the *kamrâ* (vide S. R. VI, 58—64 75—76, 80—84, 662 &c.), and *kamrâ* signified a rod or plate or shell or similar utensil, used for stopping notes with, or for gliding or rubbing on the string (vide *ibid.*, and *ibid.* 1194—96).

* **VANSA,** as desbribed in S. R. Ch. VI, 424—456, was the ancient fluto instrument of modern European piccolo type, and it was very similar to the *ârvânsi* variety of modern Indian *vânsi*. Each *vansa* had nine *randhras* (*i.e.* holes) along its length. Of these, that near to one end (of the *vansa*) was its *mukha-randhra* (**मुखरन्ध्र** *i. e.* hole for blowing into it by the mouth, S. R. VI, 427, 430 and commts.) and next to this hole were the eight other holes, which were of equal sizes and equidistant between each other (*ibid.* 427—428). Of these eight holes, the first, next to the *mukha-randhra* was termed *târa-randhra* (**तारारन्ध्र**) and the last (*i. e.* that furthest off from the *mukha-randhra* and near to the other end of the *vansa*) was for production of sound by exit of air (*ibid.* 430) *i. e.* that hole was the sound-hole. Including the *târa-randhra*, the first to the seventh of these eight holes were *swara-randhras* (**स्वर-रन्ध्र**) *i. e.* holes for playing notes (*ibid.* 429, 441) by closing or opening, as required, by the fingers (*ibid.* 441—451) similar to the six and in rare cases seven such holes, similarly played, of modern Indian *vânsis*, *sânâis* and such other flute instruments. The note played by closing all the seven *swara-randhras* of a particular *vansa* was termed its *mudritah-swarah* (S. R. VI, 441—442, 675 and commt., 683), and that was its initial note. Its pitch depended upon the distance between the *mukha* and *târa-randhras*.

† The initial note, as already said, was the *mudritah-swarah*, and that depended upon the distance between the *mukha* and *târa randhras*. Sârangadeva (in S. R. VI, 425—439) has detailed different *sâstra* (*i. e.* ancient authoritative texts) versions of the theoretical lengths, distances between the *mukha* and *târa randhras*, as well as of the sizes and distances between these and other holes, of different sized *vansas*, and he (in *ibid.* 466-502) has detailed different versions of theoretical measurements of these, as gathered by him from the opinions of different authorities versed in the *desi* system, which were at variance with the above *sâstra* versions of theoretical measurements. Being unable to accept many of these *sâstra* and *desi* versions of the theoretical measurements, as being unsuitable for, or being against actual practice (vide *ibid.* 503-524), Sârangadeva (in *ibid.* 525-647) has given his own opinion, as gathered from his personal knowledge of theory and practice of *desi* system (vide ibid. 525) and his practical experiments, about what ought to be these measurements.

In all the abovementioned *sâstra* and *desi* versions, of the 9 holes of *vansas* mentioned before, the size of the *mukha-randhra* is spoken of as differing from that of the eight other holes, which latter are spoken of as being equal sized and equidistant from each other. The latter eight are spoken of as being of the same size and of the same distance apart in all sized *vansas* in the *sâstra* versions, and these are spoken of as being the same in the same sized *vansa* and differing in different sized *vansas* in the *desi* versions. In one of these *sâstra* versions the distance between the *mukha* and *târa randhras* is spoken of as 18, 16, 14, 12, 11, 10, 9, 8 to 1 *angula* respectively for different *vansas* tuned to the *mudritah* (*i. e.* initial) notes lower sa, ri, ga, ma, pa, dha, ni, middle-sa to upper-sa respectively (vide S. R. VI, 427, 431-436, 441-444). In another *sâstra* version *sa ri ga* are spoken of as being produced by the left

from other positions that were alloted for other notes at the time of tuning. For playing such a *gita* or *Râga* &c. in a *vinâ* or *vansa*, the actual practice, as far as can be seen from descriptions in S. R. and other more ancient texts was, to select, fitting either the *grâma* or *moorchhanâ* or the range of notes of that *gita* or *Râga* &c., a suitable position (from amongst the positions meant for playing notes), for the *sa* note, or for the *ansa* or *vâdi* or *graha* or *sthâyi* note of that *gita* or *Raga* &c. (irrespective of that being or not being the position alloted for that note, at the time of tuning) and to base that note on that position, and the consecutive notes on the consecutive positions alloted for production of notes, and from the positions thus adopted, the notes of that *gita* or *Râga* &c. were then played. The above-mentioned initial basic position was selected according to the taste and judgment of the player. I quote

ring, middle, and index fingers, and *ma pa dha ni* as being produced by the right little to index fingers consecutively (vide *ibid.* 449-451). [By the same fingers, in all sized modern Indian *vânsis* and *sânâis*, in cases of seven *swara-randhras* (*i. e.* holes for playing notes) and by the same excepting the little finger in cases of six such holes, *sa* is played by closing all these holes, and by opening by these fingers consecutively, all these holes consecutively one after another, *ri* to upper *sa* in the former, and *ri* to *ni* in the latter cases are played. The pitch of this *sa* differs in different sized instruments.]. In another of the abovementioned *sâstra* versions, *vansas*, the distances between whose *mukha* and *târa randhras* are 6, 7 and 8 *angulas* are spoken of as producing the upper octave, and of those whose that distance is 9 or 10 or 11 *angulas* are spoken of as producing the middle octave, and of those whose that distance is 12 or 13 *angulas*, are spoken of as producing the lower octave, and of those whose that distance is 14 *angulas* are spoken of as having the function of producing all the three octaves (*ibid.* 463—465).

The abovementioned **ANGULA** (अङ्गुल), which was the unit measure of ancient periods for musical instruments, represented the length of the thumb joint, and 12 *angulas* made one *vitasti* (वितस्ति) and two *vitastis i. e.* 24 *angulas* made one *hasta* (हस्त) *i. e.* cubit (S. R. VI, 28). In the abovementioned different versions, for different sized *vansas*, this *angula* unit is spoken of in some cases as the length of five, and in some cases five and a half barley-corns (*ibid.* 466—467), and Sârangadeva, with a view to justify some of the abovementioned *sâstra* and *desi* versions of theorical measurements by *angula* units, and to make them conform with what would be practicable, has fixed in some cases six (vide *ibid* 526—527), and in some cases four and a half (vide *ibid.* 562—563) husked barley corns placed longthwise (*ibid.*), as the measure of one *angula*.

From these different versions of theoretical measurements as detailed in S. R., it appears that **the tuning of the holes of ancient VANSAs was rough. This is the case with modern Indian flute instruments, such as *vânsi sânai* &c. also.**

In one of the abovementioned *sâstra* versions is mentioned,—"In all (sized) *vansas*, the last two holes being open, the *Dwitiyah-swarah* would be produced, and thence from *Tritiyah* up to *Saptamah* (*swarahs*) consecutively are produced through the opening of the (last) three &c. (*i. e.* the last three to the last seven) holes." (S. R. VI, 445). Thereafter Sârangadeva adds,—"The originating of the *Ashtamah-swarah*, on the *târa-randhra* being opened and the other holes being closed, have, on the other hand been adduced by the sages of anterior periods" (*ibid.* 446). These *Dwitiyah* to *Ashtamah swarahs*, as appears from Kallinâtha's commentary to above and connected texts, were the second to eighth higher *suddha* notes next after the *mudritah* note. The meaning of "the last two holes" of the above text, as appears from the same commentary, is the sound-hole and its adjacent (*i. e.* the seventh) *swara-randhra*. That, obviously is the meaning of that text, but that leaves out of account what would be played by opening all the *swara-randhras*, by which process, as mentioned above, the eighth or seventh notes, counted from the initial note, in cases of 7 or 6 such holes respectively, are played in modern Indian *vânsis*, and *sânâis*. Similar initial to the next higher eighth or seventh notes are similarly played, from similar 7 or 6 such holes, of modern European flageolets, flutes, piccolos &c., that initial note being the particular key-note, to which each of these instruments is tuned. Besides this, by the process of opening the first, nearer to the mouth and closing all the other, of these holes, a semitone above that played by opening all these holes, are played in these European instruments. Viewed from this modern Indian and European practice, the above-described ancient processes of producing the second to the eighth notes are difficult to follow, and it was probably due to some such difficulty of understanding them, that Sârangadeva has described these processes in the abovementioned language. In view of the abovementioned modern practice, I, in Gita Sutra Sar Vol. I, Parisishta, Ch.V.,pp. 327, 340 &c. have interpreted the abovementioned "the last two holes," as the last two swararandhras, and have there inferred that some sound, intermediate between the Mudritah and Dwitiyah notes was played by opeping the last (*i. e.* the 7th) *swararandhra* only. This sort of playing that intermediate sound being against the abovementioned modern practice, this interpretation is also not free from the same difficultly. Besides this, how these consecutive *suddha* notes, from the *mudritah* to the *ashtamah*, the interval between two successive ones of which, was not in every case a semitone (or two *srutis*), but, in some cases two, in some cases three, and in some cases four *srutis*, could be produced from the seven equal sized and equidistant *swara-randhras*, as mentioned above, is difficult to understand. That Sârangadeva also had experienced similar difficultly will appear from the fact, that in course of his disagreeing, as spoken of above, with different *sâstra* and *desi* versions of theoretical measurements, he says that consecutive notes *sa ri ga ma* &c. as spoken of in some of these theories, are not practically obtainable from *vansas* made in accordance with the measurements as mentioned in these theories (vide S. R. VI, 505—507).

below a few of the texts which speak of the abovementioned ancient practice*. In some of these texts, the raising or lowering a note for change of tuning from one *grâma* to another, is also spoken of. **Besides mention of** this, and the mention by Kallinatha (in S. R. Poona I, vii, 63—65 commt. near end, at p. 93, in connection with different *ansa* notes of *Shâdji-Jâti*) of the **retuning of subsidiary strings of a VINA** to suit different *ansa* notes of (different *gîtas* comprised within) a particular *Jâti*, I have met with **no** other **mention,** in any ancient book, **of** any **retuning of strings or frets of a VINA for** any other, or the abovementioned purpose of **changed positions of notes.** Such retuning, according to the taste and judgment of players, of subsidiary strings, without retuning the main strings that are meant for playing notes and also for the assumed standard *sa* note, is often done by modern expert *sitâr, vinâ, sârangi* &c. players, in these instruments, to suit different *thâts* and *Râgas*.

In any case, these theoretical measurements of holes &c. of *vansas* indicated, as mentioned above, their rough tuning, similar to those of modern Indian *vânsis, sânâis* &c. These defects of these modern instruments are overcome, and the proper *suddha* or *vikrita* notes or slight gradations of pitches, as required, are produced in modern times, by able players by skilful blowing, as well as by opening or closing the holes, by the fingers, fully or more or less partially. That similar defects as mentioned above, of *vansas*, were also similarly overcome and similar *suddha* and *vikrita* notes as well as gradations of pitches as required, were similarly produced by similar processes, in ancient periods, may easily be inferred from the texts quoted below of S. R.

Amongst abovementioned *sâstra* versions, Sârangadeva mentions,—"The entire (*swararandhra*) being opened, the whole note would be produced, and through vibratory movement by the *angula* (*i. e.* finger) there, one *sruti* (from the whole note) would be lowered and two *srutis* (from the whole note) would be lowered) on half the hole being opened, and on that vibrating (*i. e.* on that finger having a vibratory movement there) three *srutis* (would be lowered)" (S. R. VI, 447—448). "Through (skilful) blowing by well trained *vansa* players, notes in middle octave, through proximity of the mouth (while blowing), notes in upper octave, and through remoteness of the mouth, notes in lower octave would be produced". (*ibid.* 453—455). Thereafter Sârangadeva says in general terms :—"Through the raising and lowering (of the pitch) of the sound from (*i. e.* by the process of) the quickening or slowing of the air (blown) through (*i. e.* with) force and very great force, and through (*i. e.* by the process of) filling and not filling (with air), even from the hole in the same place (*i. e.* from one and the same *swararandhra*), those who know (*i. e.* are skilful) do raise various notes," (*ibid.* 456).

* Regarding *vansas*, although Sârangadeva has given, as already said, different ancient theoretical versions of measurements of holes &c. of *vansas* tuned to different initial notes, he has, however, not mentioned any actual, more ancient or his contemporary, practice of the use of such different sized *vansas* for playing different *gitas* or *Ragas* &c., on the other hand, in course of briefly describing some practical examples of the play, note after note with embellishments &c., of some *desi* Râgas (vide S. R. VI,667 & *et seq.*) Sârangadeva has spoken of the contrary practice, at his time. As for example, he has spoken of it being seen in actual practice, or being heard from persons versed in actual practice, of the *sthâyi* or *graha* notes (both of which meant the same note for purpose of *vansas*, vide *ibid.* 673-674 commts., and for purpose of *kinnari-vînâs* also, vide *ibid.* 346 commt.) *ma, ma, ga* etc. of Râgas *Madhyamâdi, Todi, Desâkhya* &c. respectively being placed on the *mudritah swarah* of all sized *vansas* (vide *ibid.* 668 & 675, 685 & 689, 712 & 714 &c.) and the *sthâyi* or *graha* notes *ma, dha, Dwigunah* (*i.e.* upper)-*sa, Dwigunah-sa*, of Râgas *Bangâla*, (*Desi*) *Bhairava, Varâti, Dhannâsi* &c. respectively, being placed on the *Dwitiyah—swarah* of all sized *vansas* (vide *ibid.* 690 & 694, 695 & 698, 699 & 701, 707 & 709 &c.) and the *sthâyi* or *graha* notes *ri, sa, dha* &c. of Râgas *Gurjari, Vasanta, Velâvali* &c. respectively being placed on the *Tritiyah—swarah* of all sized *vansas* (vide *ibid.* 702 & 704, 705 & 706, 717 & 721 &c.). Thereafter Sârangadeva says in general terms, that after placing the *graha* or *sthâyi* note of a particular Râga on a particular position of a particular *vansa*, the respective other notes, as mentioned in the theory of that Râga, should be played from the other respective positions of that *vansa*, and that such a particular position (from amongst the positions for playing notes) of a particular *vansa* should be adopted for the *sthâyi* or *graha* note of a particular Râga, that all the other notes as mentioned in the theory of that Râga be possible to play, *i e.* so that there may be no dirth of positions for playing all those other notes (*ibid.* 778-779 and commt.).

I may mention here, that in modern practice, European flute instruments of different sizes are tuned to different key-notes as initial notes and to consequtive notes. In modern Indian practice, no particular sized indigenous flute instruments such as *vânsi, sânâi* &c. are used for particular Râgas or *thâts*, but these instruments of all sizes are tuned, as already said, to *sa* and roughly to consecutive *suddha* notes and the pitch of that *sa* differs in different sized instruments. Some *sânâis*, however, are provided with three or more mouth pieces of different lengths, the one or the other of which, according to the taste and judgment of the player, is fitted to the instrument for playing different Râgas or *thâts*. A few more texts which speak of the abovementioned practice, are quoted below.

Amongst different versions regarding forms of *moorchhanâs*, as described in more ancient text books, Sârangadeva speaks of the following, amongst other versions of forms of *moorchhanâs*,—**षड्जस्थानस्थितैर्न्यासै रजन्याद्याः परे विदुः ।
हारिणाश्वादिका गान्धैर्मध्यमस्थानसंस्थितैः ॥** (S. R. Cal. I. iii, 14). This text, as explained in its commt. (which is not quoted above) says,—"Others consider, that by *ni* &c. (*i.e.* by *ni, dha, pa, ma* &c. being placed) in place of *sa* (of the first *moorchhanâ* of *shadja-grâma*, are produced) *Rajani* &c. (*i.e.* they become the 2nd, 3rd, 4th &c. *moorchhanâs* respectively,

In modern European key-board instruments, such as the pianoforte, organ &c, and clarionet, cornet &c. and other keyed instruments, and stringed instruments with frets such as the guitar, mandoline &c., changed positions of a governing note (*i.e.* Key-note), and its consecutive notes on that basis, do take place in change of keys, but the tuning of these European instruments, and the abovementioned change of positions for key-changes, are all based on tempered notes and scales, which was not the case with the abovementioned ancient Indian system. So far as can be seen from the abovequoted and similar other texts, as well as from the descriptions of playing of *vansas* and of different sorts of *vinâs* and from the illustrations of some *desi* Râgas played in *kinnari-vinâ* and *vansa* as given by Sarangadeva (in S. R. Ch. VI), it appears, that notes with natural 2, 3, or 4 &c. *srutis*, as well as with slight gradations of these intervals and also slight gradations of pitches in graces and other embellishments, suiting different Râgas as well as the tastes of players, as are performed in modern times in modern indigenous Indian stringed instruments *e. g. vinâs, sitârs* &c. and flute instruments such as *vânsis* including *drvânsis*.

of *shadja-grâma*, and) by *ga* &c. (*i.e.* by *ga, ri, sa*, &c. being placed) in the position of *ma* (of the first *moorchhanâ* of *madhyama-grâma*, become) *Hârinâsvâ* &c. (*i.e.* the 2nd, 3rd, 4th &c. *moorchhanâs* respectively, of *madhyama-grâma*). Then Sârangadeva adds,—षड्जादीन् मध्यमादींश्च तदूर्ध्वं सारयेत् क्रमात् ॥ (S. R. Cal. I, iii, 15). *i.e.* "*Sârayet* (*i.e.* do cause to go) in regular sequence, *sa* &c. and also *ma* &c., above these." In commt. to this text Sinhabhupâla says,—षड्जर्षभगान्धारादीन् मध्यमपञ्चमधैवतादींश्च ऊर्ध्वं सारयेत्। उत्क्रमेषु स्वरेषु स्थापयेत्। यदा निषादः षड्जस्थाने स्थापितस्तदा षड्जः ऋषभस्थाने ऋषभो गान्धारस्थाने इत्यादि। यदा धैवतः षड्जस्थाने तदा निषादः ऋषभस्थाने षड्जो गान्धारस्थाने इत्यादि स्वरमौख्यम्। ननु कथमन्यस्य स्वरस्य अन्यस्वरस्थानेऽवस्थानक्रमः ? नाऽयं मुख्योव्यवहारः किन्त्वौपचारिकोऽयं व्यवहारः। अथवा दन्तिलादिभिरङ्गीकृतत्वादेवमुच्यते। दन्तिलोहि स्वेच्छया यस्यां कस्यामपि श्रुतौ षड्जं स्थापयेत् तदपेक्षया च श्रुतिनियमेन अन्यान् स्थापयेदित्युक्तवान्। यदाह—"षड्जत्वेन गृहीतो यः षड्जग्राम(मे)ध्वनिर्भवेत्। ततस्तूर्ध्वं (ततऊर्ध्वं) तृतीयः स्यात् ऋषभोनात्र संश(श्र)यः ॥ ततोद्वितीयोगान्धारश्चतुर्थो मध्यमस्ततः। मध्यमात् पञ्चमस्तद्वत् तृतीयो धैवतस्ततः ॥ निषादोऽतोद्वितीयस्तु ततः षड्जश्चतुर्थकः।" इति, विवृतञ्चैतत् प्रयोगस्तवकाख्यायां दन्तिलटीकायाम्—"षड्जत्वेन षड्जस्वरभावेन गृहीतः परिकल्पितः बुद्ध्या व्यवस्थापितो यः कश्चिद्ध्वनिविशेषः स षड्जाख्यग्रामे भवेत्तस्माद्ध्वनिविशेषादूर्ध्वं तृतीयः स्यादृषभः" इति। अनेनैवाभिप्रायेन दन्तिलः षड्जग्राममूर्च्छनानां मध्यमग्राममूर्च्छनानां किञ्चिद्वि कारेणैक्यमुक्तवान्। यदाह—"गान्धारं धैवतोकुर्य्याद्विश्रुत्युत्कर्षणाद्यदि। तद्वशान्मध्यमादींश्च निषादादीन् यथास्थितान्। ततोऽभूदृषभावतिथ्येषा षड्जग्रामस्य मूर्च्छना। जायते तावतिथ्येव मध्यमग्राम मूर्च्छना ॥ श्रुतिद्वयापकर्षेण गान्धारीकृत (कृत्य)धैवतम्। पूर्ववन्मध्यमाद्यांश्च(द्याश्च) भावयेत् षड्जमूर्च्छना" इति। स्वेच्छया षड्जावस्थापनमङ्गीकृत्यैव दन्तिलदत्तप्रजापत्यादयः अवधानं गान्धर्व्वाङ्गत्वेनाङ्गीचक्रुः। यदाह दन्तिलः—"पदस्थस्वरसङ्गतस्ताने(स्ताले)न सुम(सुमि)तस्तथा। प्रयुक्तश्चावधानेन गान्धर्व्वमभिधीयते।" इति। दत्तप्रजापतिरपि—"अवधानानि गान्धर्व्वं पश्चात् स्वरपदादयः। अवधानातिरेकेन त्रिविधं नोपपद्यते" इत्याह। अवधानानि नाम अन्येषां स्वराणामुच्चाणमिति यावत्। यद्यपि स्वराः स्वेच्छया नावस्थाप्यन्ते तदा अवधानं नोपयुज्यते। शार्ङ्गदेवेनापि चलवीणायां सारणानिरूपणेनाऽयं पक्षः किञ्चित् स्वीकृत एव "स्वोपान्त्यतन्त्रीमानेयास्तस्यां सप्तस्वरा बुधैः" इत्युक्तत्वात्। लोके च वैणिकाः स्वेच्छया स्वरानवस्थापयन्तो दृश्यन्ते इत्यास्तां विस्तरः।...."(S. R. Cal. I, iii, 15 commt.). The *Dantila* texts quoted in above commt. are verses 12—14, 26—28, and 3, at pages 2, 3 and 1 respectively of the printed Dattila, and the portions of these, shown within brackets in above, are the principal variations of readings of that printed Dattila. That printed book, as already said (at p. 86 at notes) contains texts only, but no commt. of Dattila (or Dantila).

In above commt. Sinhabhupâla says.—"*Sa ri ga* &c. and *ma pa dha* &c. *sârayet* (*i.e.* are caused to go) upwards *i.e.* are caused to be placed in the upper notes. When *ni* is placed in the place of *sa*, then *sa* in place of *ri*, *ri* in place of *ga* &c. (are to be placed). When *dha* (is placed) in the place of *sa*, then *ni* in the place of *ri*, *sa* in the place of *ga* and such others are the assemblage of notes. Qestion. How is the situation in regular seqnence, of the other note in the place of another note? Answer. This is not the principal use but this is an indicative (or allusive) use. Or, on the other hand, it is so said, on account of it being agreed upon (or being within the approval of) Dantila &c.. *Sa* is to be caused to stay (*i.e.* is to be placed) in some or other *sruti* at will, and pertaining (*i.e.* relative) to that by rule of *srutis* (*i.e.* of *sruti* intervals between notes) others (*i.e.* other notes) are to be caused to stay, so did, indeed, say Dantila. So says (he)—'*Shadjatvena grihitah* (i.e. adopted with the function of *sa*) *jah* (*i.e.* which) *dhvanih* (*i.e.* sound), *shadjagrâme bhavet* (*i.e.* does happen to be in *shadja-grâma*), above that, the next third (*i.e.* three *srutis* above that) no doubt does happen to be *ri*. Above that the next second (*i.e.* two *srutis* above that *ri*, does happen to be) *ga*, from that the next fourth (*i.e.* four *srutis* above that *ga*, does happen to be) *ma*. From *ma* similarly (*i.e.* four *srutis* above, does happen to be) *pa*,

sânâis &c. which, and the processes of playing notes as well as graces and embellishments in which, are similar to these ancient *vinâs* and *vansas*, were also similarly performed for similar purposes, in ancient times in these ancient instruments. It may be asked, as to how, without recourse to any tempering of notes, similar to that of the modern European system, could the notes in their just natural intervals be produced in the changes of positions of consecutive notes in instruments, in the abovementioned ancient Indian syetem. That these were practiable in ancient free-toned instruments (without frets), by

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from that the next third (*i.e.* three *srutis* above that *pa*, does happen to be) *dha*, and *ni* (does happen to be) the next second from that (*dha*). From that (*ni*), *sa* (does happpen to be) the next fourth.' (*Dantila* says) in this manner. This application is also narrated in the commentary of *Dantila* called *Tavaka*, in this manner—'*Shadjatvena* (*i.e.*) as (or with the property of) *shadja-swara* (*i.e.* of *sa* note or tone) *grihitah* (*i.e.*) is assumed, (or) arranged with judgment, *jah* (*i.e.*) *kaschit* (*i.e.* some) particular sound, that does happen to be in *shadja-grâma*, from that particular sound. the next third upwards (*i.e.* three *srutis* higher) does happen to be *ri*.' With this purpose in view, *Dantila* did speak in a little varied way (*i.e.* a little indirectly) of the similarity of *moorchhanâs* of *shadja* and *madhyama gramâs*. So says (Dantila),—'If *ga*, from raising two *srutis* is made (to function) as (*i.e.* is endowed with the property of) *dha* and from control thereof (*i.e.* relative to that) *ma et seq.* as *in situ* (are made to function as) *ni et seq.*, thence, from what numbered (*i.e.* either 1st or 2nd or 3rd &c.) had been the *moorchhanâ* of shadja-grâma, is born (*i.e.* is produced) that numbered *moorchhanâ* indeed, of *madhyama-grâma*. By lowering two *srutis*, *dha* being made (to function) as *ga*, and *ma et seq.* (being made to function) as (they were) before, does cause to be (*i.e.* by that process is caused to be reproduced) *shadja-moorchhanâ*' (*i.e. moorchhanâ* of *shadja-grâma*), in this manner (says Dantila). Surely, (it is) by consenting to the placing *sa* at (positions at) will, (that) *Dantila*, *Dakshaprajâpati* &c. did agree to (or accept, or did speak of) *avadhâna* by its property of being part of the body of *gândharva*. So says *Dantila*,—'composed of *padas* (*i.e.* of letters, or word, or verse, or collection of words, or stentence) and of assemblage of *swaras* (*i. e.* of notes or tones) well measured also by *Tâla*, and applied as well by *avadhâna* is termed (*i. e.* bears the name of) *gândharva*,' (Dantila says) in this manner. *Dakshaprajâpati* also (says),—'*Avadhânas*, *gândharva*, followed by *swara pada* &c., by excess (by additional counting, or by separate inclusion) of *avadhâna*, of three sorts, is not attributable.' This (Dakshaprajâpati) says. *Avadhâna* in fact implies uttering (*i e.* performing) of other notes. If notes are not caused to be placed in positions at will, then *avadhâna* does not properly suit (or apply). This view is indeed, somewhat acknowledged by Sârangadeva, by his *sârana*-indication (or arrangement) in *chalavinâ*, from his saying (in that connection) of this,—'In it (*i.e.* in the *chalavinâ*) the (sounds of the) seven notes (in their respective strings) are to be brought (by *sâranâs*) to (the sounds of) the adjacent respective (lower) strings by the learned (or sensible) persons.' Thus do be the description (of the above subject) at length....." (S. R. Cal. I, iii, 15 commt.). I have already (at p. 90 notes) explained the meaning of, as well as the devices adopted for, the abovementioned *sâranâ*. The abovequoted Sârangadeva's text about *sâranâ* is to be found in S. R. Cal I, ii, 17; *sc.* Poona I, iii, 19, and the nature of that *sâranâ* in *chalavinâ* (without mention of the particular devices that are to be adopted for that *sâranâ*), has been described by Sârangadeva in the connected texts. In the above English rendering, I have added, in the portions within brakets, explanatory notes gathered from the above, as well as connected S. R. Cal.. and S. R. Poona texts and commts..

I give below two illustrations, with seven notes and *sruti*-intervals between these notes, in each case showing what is meant by the reducing of the *moorchhanâ* of the one *grâma* to that of another, in the abovequoted *Dantila's* text,—

Second *Moorchhanâ* of *Shadja-grâma* reduced to second *Moorchhanâ* of *Madhyama-grâma*.

Ni	4	sa	3	ri	2	ga	2	+	2	ma	4	pa	3	dha—of *Shadja-grâma*.
ga	4	ma	3	pa	2	+	2	dha	2	ni	4	sa	3	*ri*—of *Madhyama-grâma*.

Third *Moorchhanâ* of *Madhyama grâma* reduced to third *Moorchhanâ* of *Shadja-grâma*.

ri	2	ga	4	ma	3	pa	2	+	2	dha	2	ni	4	*sa*—of *Madhyama-grâma*.
Dha	2	Ni	4	sa	3	ri	2	ga	2	+	2	ma	4	pa— of *Shadja-grâma*.

The following **modern pratice of playing RAGAs on instruments, which departs from, as mentioned below, the ordinary general method, seems to be the remnant of the abovementioned ancient change of positions in instruments, of the basic note and consecutive notes on that basis.**

In the modern ordinary general practice of playing RÂgas in *vinâs*, *sitârs* &c., the 2nd string is tuned to the lower-*sa* of the assumed standard *sa*, and on that basis, the first string is tuned to lower-*ma* and the position of

more or less pressure on the strings by the fingers and by shifting of fingers as well as of finger positions, and by gliding, as are done in modern instruments of similar types may easily be inferred. It can also easily be inferred, that such consecutive notes with their just natural intervals were, in ancient periods, performed from the self-same frets of *vînâs* and the self-same holes of *vansas*, by the same processes, by which

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middle-*sa* on the first string, is fixed on that basis. On that basis of fixed position of middle-*sa*, fixed frets are alloted in *vînâs*, in those positions, in which all *suddha* and *vikrita* notes, from lower *kari-ma* to middle-*ni* and all *suddha* notes (only) from upper *sa* to upper *ga*, may be played from the first string. In some of these instruments one or two, more or less, notes are alloted with frets, varying according to sizes of instruments and tastes of players. In *sitârs* &c. whose frets are movable (see p. 2) the tuning at the initial tuning, is similar to above in all respects, except that in these instruments, the number of *vikrita* notes alloted with frets are less, their number varying according to the sizes of these instruments and the tastes of individual players. For playing Râgas whose *thâts* include those *vikrita* notes which are not provided with frets, at the initial tuning, in these *sitârs* &c., either the proper frets are shifted to the positions of these *vikrita* notes and these notes played therefrom, or these *vikrita* notes are played from some suitable frets for lower notes, by the *Mir* process explained hereafter. In *Vînâs*, such *vikrita* notes of such Râgas are played from their respective frets, excepting the *vikrita* notes of the upper octave of these and similar Râgas, which being, as shown above, unprovided with frets, are played from some frets alloted for lower notes, by the *Mir* process. That *Mir* process of playing is adopted in other cases also, in both these types of instruments, suiting the tastes of players, and also the requirements of proper intonations, as well as of graces and other embelishments.

For playing *Râga Bhairavi* and other Râgas whose *thâts* are similar, some modern skilful players often, make the following **departure from the above ordinary method of playing**,—They raise the tune of the 1st string a semitone, in such a manner, that, from the fret alloted at the initial tuning for lower-ni on this string, may be played middle-sa in unison with lower-sa of the 2nd string. Thereafter either in *vînâs* or *sitârs*, without disturbing the tune of any other string, they, from the frets alloted at the initial tuning for,—

Ni	½	sa	1	ri	1	ga	1	*Kâri*—ma	½	pa	1	dha	1	ni

play the respective notes of *Bhairavi thât*,—

sa	½	*Kômala*-ri	1	*Kômal*—ga	1	ma	1	pa	½	*Kômal*-dha	1	*Kômal*—ni	1	*sa*

They play also the other consecutive notes from consecutive frets. Generally the frets are not shifted in this process but, as will be explained hereafter, for very fine tuning, in instruments with movable frets, some of these frets are very slightly shifted in the above process. For playing again, Râgas other than *Bhairavi* &c., mentioned above, the first string is again tuned to lower-*ma*, and the notes are played from the frets as at the initial tuning.

In the above, instead of by 4, 3, 2, &c. *srutis*, the intervals have been shown, as is generally done, in modern times by modern musicians for *thâts* which include *vikrita* notes, as full-tones and half-tones, by the signs 1 and ½ respectively.

Slight adjustments of frets. Besides slight adjustments of movable frets, suiting peculiar pitches of particular *vikrita* and also (in same cases) of *suddha* notes, of particular Râgas, slight adjustments of frets are also taken recourse to in the abovementioned tuning for Bhairavi &c., and also in other cases of raising or lowering the tunes of strings, *e. g.* to suit different singers, or accompanying instruments. The theoretical reason for this is as follows :—The frets (as spoken of before at p. 6 notes) being of graduated heights, the tension on the open string, compared with the tension on the vibrating portion of that string as stopped on each fret, slightly vary for each fret. Any appreciable change of tension of the open string, due to change of its tuning, or to the replacing of that string by another string of greater or less density or thickness, changes also the tension on the vibrating portion of that string as pressed on each fret, and also the proportions of these tensions, compared with each other. This change of proportion of tensions affects the tuning of the frets. Theoretically the distance from the bridge of a fret, tuned to a particular note, is required to be changed in such cases. Practically, however, only musicians with very nice ears can notice that disturbance, and only for fine tuning, a few frets only, are required to be very slightly shifted, and they are so shifted for such fine tuning in such cases.

In *vînâs* of old types, also termed *vina* and *vin*, the frets are rigidly fixed and cannot be shifted at will in course of playing, and in these, the abovementioned defects of tuning cannot be remedied by shifting of frets. In these instruments, these defects of tuning are remedied by *Mir* process of playing, but as that process is more difficult than the abovementioned shifting of frets, and as the sounds of these *vînâs* are very low, not reaching fully more than three or four yards, in actual practice, in spite of their sweeter sounds due to their bridges being of the type of violin bridges, these old type VINAS with fixed frets have become very rare nowadays giving place to Sitar type VINAS with movable frets, and to Sitars &c..

Graduated heights of frets have been spoken of above. Regarding these, I have spoken before (at p. 6 notes) that the frets near the nut are tallest and those near the bridge are shortest in height. In good instruments, however, the player himself or by an artisan, so adjusts the heights at the curves along the whole length of each fret, that in course of

gradations of pitches from the self-same frets and holes were, at these ancient periods produced, and also are produced in modern practice in similar modern instruments.*

We find from the theories, including practical examples with notes of different *Mârga* and also *Desi gitas* as well as classes of such *gitas* such as *Jâtis* and *Rágas* &c. of ancient periods as given in Brhaddesi and S. R., that **in these ancient theories,** besides the 7 *suddha* notes **three VIKRITA notes only have been applied.** These three *vikrita* notes are,—*vikrita* (or *trisrutih*)-*pa i. e. pa* of *Madhyama-grâma*, and that in that *grâma* and *moorchhanâs* and *tânas* of that *grâma* only, and besides that either *antara-ga* or *kâkali-ni* or both in place of *suddha-ga* and *suddha-ni* respectively in either *shadja* or *madhyama grâma* or in *moorchhanâs* or *tânas* of both these *grâmas*, and excepting *dha* of *Madhyama-grâma* (which did not practically differ from *suddha-dha* as shown below) being considered a *vikrita* and excepting also the case mentioned below, I have not met with the application in these

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Mir process of playing over and along the length of a fret, the string may not touch the next or any other fret for a higher note, and thereby disturb the *Mir* play. In instruments so properly adjusted, the few frets midway between the bridge and the nut are of shortest height and their adjacent frets either towards higher or lower notes are gradually higher and higher.

*The playing of gradations of pitches from a single *swara-randhra* of an ancient *vansa*, and from such a hole of a similar modern flute-type instrument by skilful blowing and by wholly or more or less partially opening that hole, and thereby producing the desired pitches of notes and sounds and also remedying thereby defects of tuning, has already been spoken of (at p. 92 notes). The producing of gradations of pitches from a self-same fret of modern fretted stringed instruments either by (1) putting more or less pressure of the finger in course of stopping the string by that finger over that fret or by (2) *Mir* process of playing, in modern old type *vinâs* with fixed frets, and in cases of *Sitârs* &c., over and above these, by (3) shifting of frets, have also been spoken of (at p. 2 and p. 95 notes). In *Esrâja*, which is played with a bow, and whose frets are movable, the above processes are applied for the above purpose, and besides these, (4) the device of lightly stopping and gliding on the string, between two frets, by the left finger, without allowing the string to touch the frets is also taken recourse to for the above purpose

The above 1st to 3rd processes are practicable in *vinâs*, *sitârs* &c. due, as already said (at p. 6 notes) to the ample distances between their frets and to the ample lengths of their strings (the vibrating portions between the bridge and nut, of their main strings being about a yard, or in larger instruments, even a little more long). These are also practicable, and there is ample scope in these, of the *Mir* process, as their fingerboards attached with frets are amply broad and their strings are not tuned with such tight tension as those of European violins, violencellos, guitars, mandolines &c., so in the *Mir* process the played string can be pulled across the fingerboard over a considerable length of a fret, without disturbing the tuning of the string by loosening its peg. In *Esrâja*, however, its played strings are more tightly tuned and its fingerboard is not so broad and the vibrating portions of its main strings (being about one and a half cubits) are not so long, so there is not much scope in *Esrâja* for the *Mir* process, and to serve that purpose the 4th of the abovementioned device is adopted in it.

From descriptions of ancient fretted **VINAS** (*i. e.* stringed instruments) in S. R., R. V. &c. we find that these were similar to modern old type *vinâs*, and were similarly played. These ancient fretted *vinâs* consisted chiefly of a *Danda* (दण्ड *i. e.* rod like piece) of bamboo or wood perforated through its length, to the front of which frets were attached forming the fingerboard, and to the back of which at two places two gourd-shells of different sizes were attached, and to the bottom of which a flat piece of wood topped with a bridge of iron or similar plate, was attached and besides these there were arrangements for attaching the strings &c. We also find, as shown below, from these descriptions, that moving of frets as well as *Mir* process of playing in these fretted instruments were in practice in very antique periods. From these it may easily be inferred that the abovementioned *Mir* process and shifting of frets were also adopted in ancient periods for producing desired gradations of pitches of notes and other sounds, from the self-same frets of ancient fretted instruments, for the abovementioned purpose.

Sârangadeva has spoken of placing the frets of fretted *vinâs* to their *Dandas*, with **लिप्ता वस्त्रमषीमिश्रमदनेन** (S. R. VI., 260, *i. e.* with an addhesive mixture of wax with burnt cloth) and in case of *Brhati* (*i. e.* large sized) *Desi* (type of) *Kinnari vinâ*, he has spoken of attaching its 14 main frets as follows :—.....**ईषदस्पष्टसरिका सारिकास्ता निवेशयेत् ॥** (298) **॥ मदनेनेष्टका-चूर्णमिश्रेण श्लेष्मणं दृढम् ॥ सारोणामथवा वस्त्रमषीमिश्रेण संमितम् ॥** (299), (S. R. VI, 298-99) *i. e.* ".....do place properly these slighly-imperceptibly-movable frets. With wax mixed with brick powder, or (with wax) properly added with burnt cloth, the adhesion of the frets (is to be) strong". Besides speaking of placing, in that manner, of frets in their respective positions of notes, in the latter *vinâ*, Sârangadeva has spoken of attaching two or three extra frets at proper positions of higher notes as, **द्विस्त्रितोऽधिकाः सारीर्निबध्नीयात्परे त्विह ॥**.....[*ibid.* 302 *i e.* "do bind down (or that may mean do attach) however, two or three extra frets above this"]. Besides the above adjective 'slightly-imperceptibly-movable' of frets, I have not met anywhere else of any mention of moving of frets by Sârangadeva. By accepting the abovementioned interpretation 'do bind down.....extra frets' of that text, and keeping in view the modern practice, as shown below, of binding movable frets with threads, we may infer that some such ancient practice of binding movable frets, Sârangadeva had in view in that text.

The frets of modern old-type *vinâs* are rigidly attached to their *Dandas* with lac or with some mixture with wax, and these frets cannot be shifted at will in course of playing. I have already said that all *suddha* and most but not all the *vikrita*

theories in Sangita-Ratnâkar or any other book or texts of anterior periods of any other *vikrita* note, and **in none** of these theories including the *theories of moorchhanâs, Tânas* &c. have I met with the **simultaneous application of both the suddha and vikrita forms of the self-same note.*** Thus in the allotment of notes in these ancient theories, neither have two two-*sruti* intervals been placed

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notes within the range of these *vinâs* are provided with frets. The frets of modern *sitârs* and similar instruments are bound to their Dandas with strong gut, silk or cotton threads passed through the indented edges at both ends of, or the indented edges at both sides, length-wise of, each fret. Thereby the frets are affixed sufficiently tightly to the *Dandas* and at the same time each of them can be slowly moved lengthwise of these Dandas, when required for shifting.

Sômanâtha has given detailed descriptions in R. V., of fretted *vinâs* only, and in these he has described some varieties of arrangements of frets including those of his own invention. Of these *vinâs* he has described both movable-fretted and not-movable-fretted types, the former with less numbers of frets requiring shifting of them, and the latter with larger numbers of frets, each *suddha* and most of the *vikrita* notes within the range of the latter being provided with a fret. For playing such a *vikrita* note, not so provided with a fret, in the latter type, Sômanâtha has arranged its playing from a fret for a lower note by the process of—"वामहस्ताङ्गुल्या तन्त्याकर्षणात् श्रुतयः...अधिकाः कृताः" (R. V. II, 39 commt.) *i. e.* "through *srutis* (*i. e.* specific pitches of sounds) being raised through (the process of) pulling the string by the left finger" *i. e.* by what is at present called the *Mir* process of playing. Sômanâtha has not, however, described different arrangements for attaching the frets of movable and not movable fretted types, but regarding attaching frets to *Dandas* of *vinâs*, he has spoken in general terms,—"दग्धवस्त्रमिश्रितेन सिक्थकेन दंडे श्लेष्या" (R. V. II, 13 commts.) *i. e.* frets are "to be adhered to the *Danda* with wax mixed with burnt cloth." Regarding shifting of required frets, for purpose of a particular Râga, from the positions of these frets at the initial tuning, Sômanâtha has advised, such frets,—"तत्तत् स्थानादुद्धृत्य स्थानान्तरे स्थाप्यन्त इत्यर्थः" (R. V. II, 17 commt.) *i. e.* "being raised from their respective positions are caused to be placed in other positions, that is what is meant" (by the corresponding R. V. II, 17 main text, not quoted here). From these descriptions of Sômanâtha and also those of Sârangadeva in S. R. VI, 298-299, 302 as quoted before by me (at p. 96), it can easily be inferred that in ancient periods frets were attached to the *Dandas* of *vinâs* with a paste, of wax mixed with burnt cloth or with brick powder, and that such frets, when so required, could be raised from their respective positions and re-attached to other positions. From "slightly imperceptibly movable frets" as described in S. R. VI, 298 text quoted before by me (at p. 96) it can also be inferred that the frets, attached in abovespoken manner, could be, and were in practice, very slowly shifted along the length of the *Danda*, when so required.

Sômanâtha has explained his abovementioned non-provision of frets for some notes and his arrangement for performing of such notes by (what in modern times is known as) *Mir* process (no doubt on thinking that to be an innovation of his, not mentioned in authoritative ancient books such as S. R., and therefore likely to be looked down upon by his contemporary musicians), by saying,—"आकर्षणेन स्वरान्तरत्वकरणं भरतादीनामपि संमतं॥ तथाच भरतः ॥ 'द्विधातानक्रिया तंत्र्यां प्रवेशान्निग्रहात्तथा॥ तत्र प्रवेशनमधरस्वरविप्रकर्षादुत्तरस्वरमार्दवाद्वा। निग्रहश्चासंस्पर्शः' इति॥" (R. V. II, 39 commt.) *i. e.* "Making of the function of (*i. e.* performing) another note, by pulling (the string, as a matter of fact, is), also within the approval of Bharata &c., and so (says) Bharata,—'*Tânakriâ* in strings is of two sorts, through (1) *Pravesa*, (and) through (2) *Nigraha*, likewise. There (*i. e.* the aforesaid) *Pravesa* (device) is (of two varieties, *viz.* either) through *Viprakarsha* (*i. e. Pidanam i. e.* putting pressure upon, or tightening, vide *Brhaddesi* pp. 28-29) of the lower note, or through *Mârdava* (*i. e. sithilikaranam i. e.* loosening, vide *ibid.*) of the higher note, and *Nigraha* is non-touch (*i. e.* not not-stopping),' in this manner" (says Bharata, *ibid.* R. V. II commt.). The abovementioned two sorts of *Pravesa* devices, as above understood by Sômanâtha, were no doubt, those of raising the sound by pulling the string over a fret, and of performing a lower sound than that of that raised sound, by loosening that pulled string, respectively, both of which, at modern times are known as *Mir* processes. Thus we see that those *Mir* processes existed in practice in very antique periods as that of Bharata, and we may easily infer that, like in modern times, the required gradations of pitches of notes and of other sounds were also performed, in those ancient periods, by that *Mir* process.

*Before speaking of *chatuhsrutih-dha* and the other abovementioned exceptions, I shall very briefly speak here about the theories of the ancient *suddha* and *vikrita* notes. Sârangadeva has given the theories including the *srutis* of seven *suddha* and twelve *vikrita* notes in S. R. Cal. I, ii, 13-16, 22-23, 37-43; I, iii, 1-3, 17; I, iv, 1-8: *s.c.* S. R. Poona I, iii, 13-17, 24-26, 41-47; I, iv, 1-3, 18; I, v, 1-9. I have dealt with these theories in detail with quotations from these and other original texts and commentaries, and with comparison of these ancient Indian notes with modern European and Hindustâni notes, in the Parisishta to Vol. I of this book (Gita Sutra Sar). As these theories, however, being written in very terse and technical language, in these texts and commts., are very difficult to understand at places, I shall very briefly speak here about these *sruti* theories of these notes.

Sârangadeva has spoken of the seven *suddha* notes sa ri ga ma pa dha ni being of 4, 3, 2, 4, 4, 3, 2 srutis respectively, and of these notes being in the 4th, 7th, 9th, 13th, 17th, 20th and 22nd *srutis* respectively (vide S. R. Cal. I, ii, 13-16; *sc.* Poona I, iii, 13-17 and commts). The modern theoretical SRUTI-intervals between the modern seven Hindusthani suddha notes are:—sa 4 ri 3 ga 2 ma 4 pa 4 dha 3 ni (2 *sa*). In these, the names and the series of srutis 4, 3, 2, 4, 4, 3, 2 of the seven suddha notes, being the same as those of the abovementioned seven ancient suddha notes, some modern theorists and musicians hold the view that the latter notes were the same as the abovementioned modern notes. From the abovespoken ancient suddha sa ri ga &c. being of 4, 3, &c. srutis, some modern theorists also infer that there were some relation of the sounds of each of these 4, 3, 2 &c. srutis with these ancient notes sa ri ga &c. That the sounds of each of these 4, 3, 2 &c. srutis, had no relations with these

side by side, nor have anywhere two notes one-*sruti* apart been used. These ancient theories with such simple intervals between notes, and with practically three *vikrita* notes only, over and above seven *suddha* notes, were possible, as these theories were composed with different *grâmas*, and *moorchhanâs*, the latter of which included *Tânas* and all of which, as already said were based on the ancient system of shifting at will on instruments, a basic note, and corresponding other notes on that basis. Compared with the

ancient suddha-notes, and that **though the names** sa ri ga ma pa dha ni **and their series of srutis,** as mentioned above **of the seven SUDDHA ancient Indian and Modern Hindusthani notes agree, the former are really different from the latter,** will appear from the following :—

"Question. [In what sruti a *svara* (*i. e.* note or tone) is placed (does) that] fourth and such other sruti [(*i. e.*) the 4th 7th 9th 13th 17th 20th and 22nd srutis (in cases of sa ri ga ma pa dha ni respectively previously spoken of by Sârangadeva) अभिव्यञ्जकत्वेन परिणामकत्वेन वा (*i. e.*) by property of explicit expression or by change of state (into a svara)] thus do be the cause of a svara [(*i. e.*) of sa &c.] ? What is there the significance [(*i. e.*) usefulness towards a svara of] of the previous three &c. srutis [(*i. e.*) previously situated, three srutis in each of sa ma pa, two srutis each in each of ri and dha, and one sruti each in each of ga and ni] ? We say (in answer). The fourth, third &c. sruti पूर्वाभिकाङ्क्षया निर्धार्यंते (*i. e.*) are ascertained by desire (or expectation) towards previous (srutis) [(*i. e.*) पूर्वापेक्षया निर्धार्यंते । इयं श्रुतिश्चतुर्थी इयं तृतीया इयं द्वितीया इति पूर्वाः श्रुतीरपेक्ष्यायं व्यवहारः । यदि पूर्वाः श्रुतयो न स्युस्तर्हि किमपेक्ष्यायं चतुर्थ्यादिव्यवहारः स्यात् ? (*i. e.*) are ascertained by expectation (or relative to) previous (srutis). This sruti (is) the fourth, this (is) the third, this is the second, (use) in this manner, (by) expecting previous srutis (is) this use. If previous srutis do not be then having expected (*i. e.* relative to) what does this use (of) fourth &c. be ?] For this, the previous srutis also (are the) causes (or reasons) [(*i. e.*) on this account, for ascertainment (or fixing) of the fourth &c. (do be) पूर्वासामपि श्रुतीनां हेतुत्वसिद्धिः (*i. e.*) the attainment (or fulfilment) of the causation (or utility or significance) of the previous srutis also,] here." (S. R, Cal. 1, ii, 24-25 and commt. of which the text is *sc.* S. R. Poona I, iii. 27-28). In above, the portions within " ", are from that S. R. text, and the portions within [ ] brackets are from above S. R. Cal. commt., and the portions within ( ) brackets are explanatory notes of mine.

Sômanâtha similarly says,—"......In spite of being of two srutis, ga is heard from its last and not from its first sruti. That is also the case with ri &c. In this manner, the coming of a svara from its last sruti only is clear from (the) various (sorts of) *vinâs*. From these (vinâs) it is in this way clear, वैणिकाह्यनुमानेन तंत्रीषु सारीषु वा अंत्यश्रुतावेव स्वरं स्थापयंति ॥ तथैव श्रावयंति च ॥ न तु तत्र पूर्वश्रुतीनामपि प्रकाशने उपयोगः । गायनकंठेऽपि तत्संवाद एवेतिभावः ॥......(*i. e.*) since **VINA players** in either strings or frets, by guess (*i. e.* by judging by their ears) **cause to place a SVARA** (*i. e.* a note or tone) **in its last SRUTI only,** and in this manner make others hear (that svara) also. There indeed is no usefulness of expressing (or producing) the previous srutis also. Voice of a singer also in that manner is (of) similar sound (*i. e.* the sound of a svara as intonated by the voice of a singer, is similar to the sound of that svara as produced from a vinâ, and so by analogy it should be understood that the former sound is also of the last sruti of that svara), that is the significance." (R. V. I, 28 and commt. The portions within brackets in above, are explanatory notes of mine).

From the above, and also Sinhabhupâla's S. R. Cal. I, iii, 15 commt. quoted before by me at p. 93 notes) it is clear that in these **ancient periods,** there was **no absolute standard of pitch,** and in practical music, **strings and frets** were **tuned by guess,** without comparison with, any standard pitch, and without reference to any mechanical instruments based on *sruti* or any other theories, and that **each of the 22 srutis** of a *saptaka* (*i. e.* within an octave) **was not an individual note,** *i. e.* **was not a microtone, but** that the abovementioned 4. 3, &c. **srutis** of a note **were the measures of intervals** of that ancient system, between that note and its previous note. From these it is also clear that the modern seven *suddha* Hindusthâni, and the abovementioned ancient Indian, notes are not the same, but different. Bearing in mind what has been spoken of above, from the avovementioned Sârangadeva's texts and their commts., we can deduce the *sruti*-intervals of the above ancient seven *suddha* and also of the twelve *vikrita* notes spoken of therein, as follows :—

In these texts, Sârangadeva has spoken of the ancient seven *suddha* notes *sa ri ga ma pa dha ni*, and of the following twelve *vikrita* notes,—(1) *Chyuta-sa*, (2) *Achyuta-sa*, (3) *Chatuhsrutih-ri*, (4) *Trisrutih-ga*, (5) *Chatuhsrutih* (or *Antara*)-*ga* or *Antara*, (6) *Chyuta-ma*, (7) *Achyuta-ma*, (8) *Trisrutih-pa*, (9) *Chatuhsrutih-pa*, (10) *Chatuhsrutih-dha*, (11) *Trisrutih-ni*, (12) *Chatuhsrutih* (or *Kâkali*)-*ni* or *Kâkali*, altogether 19 notes. He has grouped, in these texts, these 19 notes within two *Grâmas* and four *Svara-Sâdhâranas*, which groups, and the *sruti* intervals of the notes of each of which groups, as can be deduced from these texts and their commentaries of Sinhabhupâla and Kallinâtha, are as follows :—

SHADJA-GRAMA formed of **7 SUDDHA** Notes

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 | 1 2 3 4 *srutis*
4 sa 3 ri 2 ga 4 ma 4 pa 3 dha 2 ni | 4 *sa*

MADHYAMA-GRAMA

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 0 0 0 0 *srutis*
4 ma 3 *trisrutih-pa* 4 *chatuhsruih-dha* 2 ni 4 *sa* 3 *ri* 2 *ga* | 4 *ma*

SADHARANA of KAKALI (*svara*), or **KAKALI-Sadharana**

with other srutis,— 0 0 0 0 0 0 0 0 0 0 &c. srutis
with other notes,— dha 4 *Kâkali* (or *Chatuhsrutih*)-ni 2 *Achyuta*-sa 3 ri &c. notes

theories of *Râgas* &c. of subsequent and of modern periods, these ancient theories were more natural. I say more natural on account of the fact that any system of notes or notation, however simple and in conformity with the human voice that may be, cannot fully represent all the gradations of pitches, forces, accents and other elements of the **natural human voice,** which **is independent of** any such

SADHARANA of ANTARA (*svara*), or **ANTARA-Sadharana**

with other srutis,— 0 0 0 0 0 0 0 0 0 &c. srutis
with other notes,— ri 4 *Antara* (or *Chatuhsrutih*)-ga 2 *Achyuta*-ma &c. notes

SADHARANA of SHADJA (*svara*), or **SHADJA-Sadharana** (with other notes of its GRAMA)

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 0 0 &c. srutis
Trisrutih-Ni 2 *Chyuta*-sa 4 *Chatuhsrutih*-ri 2 ga 4 ma 4 pa 3 dha 3 | *Trisrutih*-ni &c.

SADHARANA of MADHYAMA (*svara*), or **MADHYAMA-Sadharana** (with other notes of its GRAMA)

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 0 &c. srutis
Trisrutih-ga 2 *Chyuta*-ma 4 *Chatuhsrutih*-pa 4 *Chatuhsrutih*-dha 2 ni 4 *sa* 3 *ri* 3 | *Trisrutih-ga* &c.

Regarding the last two *Sâdhâranas*, Sârangadeva says,—"**Sadharana of Madhyama** (is) of sure (*i. e.* is as a matter of course) **within Madhyama-Grama**" (S. R. Poona I, V, 8; *sc.* Cal. I, iv, 8) 'from that it also follows that Shadja-Sâdhârana is indeed in Shadja-Grâma (*ibid*, Cal. commt.). Kallinâtha, in connection with Moorchhanâs, has in S. R. Poona I, iv, 17 commt. quoted the text of Bharata, which says,—"**In Shadja-Grama** (is) **Shadja-Sadharana** (and) in Madhyama-Grâma is Madhyama-Sâdhârana." After saying what is spoken of above, Sârangadeva adds:—"These two (*i. e.* Shadja and Madhyama) Sâdhâranas (are called) the two **Kaisikas**, due to their minuteness (of difference from their original forms in their original Grâmas) like the tip of a *Kesa* (*i. e.* of a hair). These two are also termed by some learned (or sages) as the two **Grama-Sadharanas**" (S. R. Poona, I, v, 9; *sc.* Cal. I, iv, 8. In these the portions within brackets are explanatory notes of mine.)

From the *sruti* intervals shown above, if we allot to each of the 19 notes, its specific sruti position within the 22 *srutis*, as done by Sârangadeva, (as mentioned above), in case of the notes of Shadja-Grâma *i. e.* of the 7 *suddha* notes, we would find that both sa and *Achyuta*-sa would be in the 4th sruti, and both ri and *Chatuhsrutih*-ri would be in the 7th sruti, and both ma and *Achyuta*-ma would be in the 13th sruti, and both *trisrutih*-pa of Madhyama-Grâma and *Chatuhsrutih*-pa of Madhyama-Sâdhârana would be in the 16th sruti, and both dha and *Chatuhsrutih*-dha would be in the 20th sruti. These five pairs include besides *Trisrutih*-pa of Madhyama-grâma, five out of the twelve *vikrita* notes mentioned by Sârangadeva. Sômanâtha, after pointing out that each of these five Sârangadeva's *vikrita* notes had been in the same sruti with the notes of its abovementioned respective pair, has said that each of the former had not been different from each of the latter respectively (vide R. V. I, 25-26 and commt.). Thereafter, saying that Sârangadeva also, while taking account of *Punaruktis* in calculations for numbers of *Kuta-Tânas*, had not considered *Chatuhsrutih*-dha (included amongst the above five vikritas) to be different from *suddha*-dha, Sômanâtha has concluded that these five *vikrita* notes of his anterior periods, though they had been different in theory, yet in practical music, they had not been different from, but the same as, the notes of their respective pairs, (vide *ibid.* 27 and commt.). I shall speak of that non-differentiating of *Chatuhsrutih*-dha by Sârangadeva hereafter. I shall now speak of the vikrita notes of Shadja and Madhyama Sâdhâranas.

Leaving out the above five *vikrita* notes there remain seven ont of the twelve Sârangadeva's vikrita notes, in which seven, *Trisrutih*-ni and *Chyuta*-sa of *Shadja-Sâdhârana* and *Trisrutih*-ga and *Chyuta*-ma of *Madhyama-Sâdhârana* are included. I have not met with the application of any of these four vikrita notes in the theory of any Râga, in S. R. or its anterior books Brhaddesi and Dattila, but the only mention of the application of the above two *Sâdhâranas* that I have met with, is in the following:—

The above two Sâdhâranas were included amongst the four *Svara-Sâdhâranas* mentioned above by me. Sârangadeva (in S. R. Poona 1, vii, 21-23 *sc.* Cal. I, vi, 20-22) has spoken of some general rules as laid down by Bharata and also by Kambala, Asvatara &c. regarding the application of *Svara-Sâdhârana* in some cases, in some *Jâtis* and in some *Râgas* also. Kallinâtha in his (*ibid.* Poona) commt. to above text has interpreted that word '*Svara-Sâdhârana*' of that text, as the two, viz. *Kâkali* and *Antara* (Sâdhâranas), but Sinhabhupâla in his (*ibid.* Cal.) commt. to above text, has included *Shadja* and *Madhyama Sâdhâranas* within that '*Svara-Sâdhârana*' of that text. I may mention here, that Dattila has described *Svara-Sâdhâranas* as being of the two *svaras Kâkali* and *Antara* (vide Dattila p. 5 verse 46). Besides, in the above interpretation in abovementioned Sinhabhupâla's commentary, I have not met with the application of either *Shadja* or *Madhyama Sâdhârana*, or of any of the four *vikrita* notes mentioned above, included within them, in any theories of *Jâtis*, *Râgas* or of other classes of *gitas*, in either S. R. or in books of anterior periods. It may be inferred that the hairbreadth minuteness of these two *Sâdhâranas* spoken of by Sârangadeva as mentioned above, signified that the difference of *Trisruti*-ni and *Chyuta*-sa of *Shadja-Sâdhârana* from *suddha* ni and sa respectively, and of *Trisrutih*-ga and *Chyuta*-ma of *Madhyama-Sâdhârana* from *suddha* ga and ma respectively, described as the difference of one-*sruti* in each case, was very minute, *e. g.* similar to that of one degree, or that between lah and lay as described in the Standard Course by John Curwen mentioned before (at p. 22 notes) by me, and that the abovementioned non-mention in abovementioned theories, of either of these two *Sâdhâranas*, or of the abovementioned four *vikrita* notes, had been due to the abovementioned minuteness of differences of these four *vikrita* notes, these four being the specific *vikrita* notes of these two *Sâdhâranas*. That these four were their specific *vikritas* would be found from the fact that the other vikrita notes

system of **notes, GRAMAS, THATS, Scales** or **Notation,** and thus, **there must be some artificiality** and therefore, obstacle **to be got over,** by a beginner in course of his training **in** exercises, or in solfa-ing or in singing pieces of written music. based on **any such system. The** abovementioned **ancient Indian theories,** however, based as these were on two *grâmas*, one of

of these two *Sâdhâranas* were three, *viz*, *Chatuhsrutih*-ri, *Chatuhsrutih*-pa and *Chatuhsrutih*-dha which were included amongst the five pairs of vikrita notes mentioned before. I shall now speak of *Kuta-Tânas*.

Kuta-Tanas and calculations of their numbers by ancient mathematical processes are described very briefly in Dattila p. 4 verses 38-41, and that has been a little more elaborately explained with a few illustrations by Matanga in Brhaddesi at pp. 30-32. Sârangadeva has explained these more fully in S. R. Cal. I, iii, 31—67 ; *sc.* Poona I, iv, 32-70, which have been more elaborated by Sinhabhupâla and Kallinâtha and of them by the former more clearly, in *ibid.* commts. The former commentator has also quoted in that commt. some of the abovementioned texts of Dattila and Matanga, by comparison with which, some of the very serious errors and omissions in the readings of each may be corrected. Each of these authors and commentaters, no doubt, did describe in more detail, with a view to help his contemporary readers, what was written by his predecessors on the subject, yet, not to speak of the serious errors and omissions in the readings, as these descriptions are full of ancient technical terms and as these deal with ancient practices, which we are not conversant with, these, to us, are very difficult to understand and abstruse at places. I shall briefly speak here what I have understood from above texts and commts. about *Kuta-Tânas* and calculations of their numbers.

KUTA-TANA(कूटतान)s says Sârangadeva, "were notes of *Sampurnâ*, and *Asampurnâ Moorchhanâs* performed *vyutkrama*" (S. R. Cal. I, iii, 31 ; *sc.* Poona, I, iv, 32). I shall now explain these technical terms. Matanga, in the Brhaddesi texts mentioned above, and Sârangadeva's commentators in the S. R. commts. mentioned above, have explained some of these technical terms and calculations for Kuta-Tânas, with illustrations, in some cases. These illustrations are, however, with initial syllables सरिग &c. of notes only, but in none, any signs for different *saptakas* are given. I could understand these calculations and figures for *Kuta-Tânas*, with the help of such illustrations, with signs added to by me, for notes of different *saptakas*, and these illustrations of mine, fitted in well with the abovementioned figures. Thus these illustrations of mine, may be assumed to be correct. With the help of such illustrations I shall explain the above technical terms and some of the abovementioned Sârangadeva's calculated figures, and in doing so, I shall use the following abbreviations :—Besides the abbreviations for notes used before (at pp. 83-84 notes), I shall use for notes *Antara* or *Antara*-ga,—a-g ; for note *Kâkali* or *Kâkali*-ni,—k-n ; for *Sampurnâ* also termed *Purnâ* (fem.), or *Sampurna* also termed *Purna* (masc.), all of which literally meant, complete, and in this connection complete with 7 notes,—Pn. ; for *Asampurnâ* also termed *Apurnâ* (fem.), or *Asampurna* also termed *Apurna* (masc.) all of which lit. meant 'incomplete,'—Apn. ; for *grâma*,—Gm. ; for *Shadja*,—Sdj. ; for *Madhyama*,—Mdm. ; for *Moorchhanâ*,—Mn. ; for *Bheda*,—Bhd. ; for *Krama*,—Km. ; for *Kuta-Tâna*,—K. T. ; for *Prastâra*,—Pst.. *Sampurnâ-Moorchhanâs* were 7—noted moorchhanâs, seven each of Sdj. and Mdm. Gms. These, including their names and their notes of different *saptakas*, but with 7 notes in ascent only, were the same as those illustrated before (at p. p. 83, 84 notes) by me 'as *moorchhanâs* as described by Sârangadeva.' Thus, the first to the seventh Pn. Mns. of Sdj. Gm. were,—srgmpdn Nsrgmpd DNsrgmp PDNsrgm MPDNsrg GMPDNsr RGMPDNs respectively, and the first to the seventh Pn. Mns. of Mdm, Gm. were,—mp'dnsrg gmp'dnsr rgmp'dns srgmp'dn Nsrgmp'd DNsrgmp' P'DNsrgm respectively. *Asampurâ-Moorchhanâs* would be those, formed of 6 to 1 notes, by dropping out from each Pn. Mn., from its last note, one note after another, up to six notes, *e. g.* of the above fifth Pn. Mn. of Sdj. Gm., the following six were Apn. Mns.,—MPDNsr MPDNs MPDN MPD MP M. Thus of each Pn. Mn. could be six Apn. Mns., similar to above. Each of these Pn. and Apn. Mns. could have *Bhedas i. e.* varieties, through either *Antara* or *Kâkali* or both, in place of ga and ni respectively. Each of the above 14 Pn. Mns., thus, could have, as mentioned before by me (at p. 84 notes), 4 Bhds., totalling 56 Pn. Mn. Bhds.. Of each Apn. Mn. it would be seen, that which included both g and n could have 4 Bhds. and that which [included either g or n but not both, could have 2 Bhds. and that which included neither g or n could have no Bhd.. Performing the seven notes of each Pn. Mn. including those of its Bhds, in order of first to the last note, or of second to last and then the first note, or of third &c. up to the last and then the previous notes from the first, would each be a *Krama* of that Pn. Mn. or of its Bhds. *e. g.* performing Nsrgmpd srgmpdN rgmpdNs gmpdNsr mpdNsrg pdNsrgm dNsrgmp could be the Kms. of the 2nd Pn. Mn. of Sdj. Gm. In this manner each of the abovementioned 56 Bhds. of Pn. Mns. could have 7 Kramas each, totalling 392 Kms. (vide S. R. Cal. I, iii, 19 ; *sc.* Poona, I, iv, 20 and commts.). Regarding Apn. Mns., performing all the notes without repeating any, of each Asampurnâ (or Apurnâ) Moorchhanâ, including those of if Bhds., if any, in regular sequence from the first to the last note, would be a *Krama* of that Apn. Mn. or of its Bhds., *e. g.* performing MPDNsr MPDNs MPDN MPD MP M would each, be the *Krama* of the six, 6 to 1 noted abovementioned Apn. Mns. respectively, of the 5th Pn. Mn. of Sdj. Gm.. Similarly performing the notes of the Bhd. with K-N in place of N, of the above MPDNsr would be the Km. of that Bhd.. Thus the first to third of the above Apn. Mns. could have 2 Bhds. each, and with these Bhds. of each, each could have 2 Kms., but the fourth to the sixth of the above Apn. Mns., as they included neither ga nor ni, could have no Bhds., and thus of these latter, each could have one Km., as shown above, only. Performing all the notes of each Pn. or Apn. Mn. including those of its Bhds., if any, in any other than the *Krama* order, as mentioned above, would be performing *vyutkrama i. e.* against *Krama* sequence *e. g.* performing sNrgmpd gsrNmpd grsNmpd &c. would each be a *vyutkrama* performance of the 2nd Pn. Mn. of Sdj. Gm., and performing the 6-noted Apn. Mn. of that Pn. Mn., as srgmpN gmpNsr &c. would each be a *vyutkrama* performance of that Apn. Mn.. Each *vyutkrama* performance of the notes of either a Pn. or an Apn. Mn. would be a **KUTA-TANA.** Of these, such performances, of notes of Pn. Mns., would be **Purna-Kuta-Tanas,** and such performances, of notes of Apn. Mns., would be **Apurna-Kuta-Tanas.** I shall now speak of *Prastâras*.

which included one *vikrita* note only, and in both of which grâmas, as shown before, only one or two other *vikrita* notes could replace the *suddha* forms of these two notes, **were,** no doubt, **far more simple and far more in conformity with the voice of singers, than the theories of subsequent periods** of India, **and** also of **modern,** both Indian and European **systems.** That ancient system of placing a basic note at will in instruments, and playing corresponding other notes on that basis, without any artificial tempering of notes, and practically without any retuning, however, required, great skill

PRASTARA(प्रस्तार)s. It would be seen from above, that all possible numbers of *vyutkramas* (*i. e. Kuta-Tânas* together with Kramas) of the 7 notes of each Pn. Mn. and of the 6 or 5 or 4 &c. notes of each Apn. Mn. would also be, the all possible numbers of groupings, of all the notes of each, without repeating any note. All such possible numbers of groupings of all these 7 or 6 or 5 or 4 &c. notes were termed *Prastâras* of these 7 or 6 or 5 or 4 &c. notes. It would be seen from above, that these *Prastâras* of these notes were the same as the total possible K. Ts. together with Kms. of these notes. From modern Algebra it would be seen that the Pst. of 1 note could be 1 only, and the Psts. of 2 notes could be 2×1 or 2, and the Psts of 3 notes could be 3×2 or 6, and the Psts. of 4 notes could be 4×6 or 24, and the Psts. of 5 notes could be 5×24 or 120, and the Psts. of 6 notes could be 6×120 or 720, and the Psts. of 7 notes could be 7×720 or 5040. Dattila, Matanga and Sârangadeva, including both commentators of the latter, have calculated by ancient mathematical processes and formulas, and Matanga and both the commentators of Sârangadeva have also explained with illustrations, some of the above figures for Psts. of these 1 to 7 notes. I shall now very briefly explain and illustrate a few of the abovementioned calculations of numbers of K. Ts..

Nos. of Purna Kuta-TANAS. Of each Pn. Mn. could be 5040 Psts. *i. e.* K. Ts. together with Kms., and of these, 7 would be Kms. leaving 5033 K. Ts.. Dattila has mentioned this figure 5033 (vide Datila p. 4, verse 39), and that text of Dattila including that figure 5033 has been elaborated by Matanga (vide Brhaddesi p. 30). Sârangadeva, after speaking of the above 5040 Psts. has shown that of the 56 Pn. Mns. with Bhds. (mentioned before by me), could be 282240 (*i. e.* 56×5040) K. Ts. together with Kms.. Of these, it would be seen, 392 would be Kms., and the rest, the total nos. of Pn. K. Ts..

Sârangadeva has similarly calculated the total Nos. of 6 to 1-noted Apn. K.Ts., together with Kms. of each of the 6 to 1 noted Apn. Mns. of both Gms., and thereafter, deducting therefrom, the Kms.. as well as the *Punaruktis i. e.* repetitions, he has arrived at the figures for nos. of Apn. K. Ts.. I shall very briefly illustrate a few of these calculations,—Of the 6-noted (Apn. Mns. of both Gms.,) of the two sa-initial-noted (*i. e.* srgmpd of Sdj. Gm. and srgmp'd of Mdm. Gm.) and of the two ma-initial-noted (*i .e.* MPDNsr of Sdj. Gm. and mp'dn*sr* of Mdm. Gm.), there could be (as each included either g or n) 2 Bhds. of each, and of the other ten (of the 6-noted, *i. e.* of Nsrgmp DNsrgm PDNsrg GMPDNs RGMPDN of Sdj. Gm., and gmp'dns rgmp'dn Nsrgm'p DNsrgm P'DNsrg of Mdm. Gm., as each included both g and n) could be 4 Bhds. of each, totalling 48 Bhds. (of these fourteen 6-noted Apn. Mns. of both Gms.). As of each of these Bhds. could be 720 Psts., there could be (of these 6-noted) 34560 K.Ts. together with Kms.. Of these, 48 would be Kms. and the rest K.Ts.. Sârangadeva has similarly calculated the K.Ts. together with Kms., (and also the Kms. included amongst these) of the five to one-noted Apn. Mns. of both Gms.. Of these I shall illustrate here the 2-noted, and also the 1-noted, which last needs special mention,—Of the two-noted, RG, GM, DN, Ns of Sdj. Gm. and rg, gm, DN, Ns of Mdm. Gm., could have 2 Bhds. each, the rest six, *viz.* sr, PD, MP, of Sdj. Gm. and mp', sr, P'D of Mdm. Gm. (as any of them did not include either g or n), could have no Bhds.. These total 22. Of each of these could be 2 Psts.. Thus of these could be 44 K.Ts. together with Kms. Of these, it would be seen 22 would be Kms.. Regarding the one-noted (Apn. Mns.), Sârangadeva has included the fourteen, formed of the original single notes (*viz.* s, N, D, P, M, G, R, of Sdj. Gm. and m, g, r, s, N, D, P' of Mdm. Gm.), as the total 14 Kms. of the one-noted Mns. of both Gms.. It would be seen that as there could be no *vyutkrama* of any of these, each of these fourteen, would be a Km.. Sârangadeva has not included the a-g and k-n Bhds. of ga and ni, included amongst these 14 one-noted. Kalinâtha saya that, that was due to a-g and k-n singly, without being connected with other notes, would not be noticeable as distinct notes (vide S. R. Poona I, iv, 48-53 commt.). I shall next very briefly explain and illustrate, Sârangadeva's calculations of *Punaruktis i. e.* repetitions included within above calculations.

Punarukti(पुनरुक्ति)s. Sârangadeva has shown amongst others, within above calculations, that, of the K. Ts. together with Kms. of the 6-noted Apn. Mns. of both Gms. (illustrated above), of the dha-initial-noted of Mdm. Gm. (*i. e.* of DNsrgm, the 6-noted Apn., formed of the sixth Pn. Mn. of Mdm. Gm.) its 4 Bhds. with 720 Psts. of each, totalling 2880 Psts. *i. e.* K. Ts. together with Kms., having no distinctive pa (*i. e.* due to not including *trisrutih*-pa, which would have been a differentiating factor) were not different from similar Psts. (*i. e.* K. Ts. together with Kms.) of the similar 6-noted Apn. Mn. of Sdj. Gm. (*i. e.* of the 6-noted Apn. Mn. DNsrgm formed of the third Pn. Mn. of Sdj. Gm.), and thus these (2880 K. Ts. together with Kms. included amongst the calculations spoken of before) were *Punaruktis i. e.* repetitions. Similarly, amongst others, Sârangadeva has shown that, amongst the calculations for the two-noted illustrated above, of the two-noted Apn. Mns. of Mdm. Gm., of sr, having no Bhd., the 2 Psts. of it, and of Ns, having 2 Bhds. and 2 Psts. of each Bhd., totalling 4 Psts. of it, and of DN. having 2 Bhds. and 2 Psts. of each Bhd. totalling 4 Psts. of it, were, similar to and not different from, similar Psts. (*i. e.* K. Ts. together with Kms.) of similar noted ones (*i. e.* of sr, Ns, and DN) of Sdj. Gm. respectively, and thus these 2, 4, 4 Psts,) *i. e.* K. Ts. together with Kms. included within the calculations for K. Ts. together with Kms. of Apn. Mns. illustrated before) were *Punaruktis.* In this manner Sârangadeva has calculated together with the above illustrated, the other *Punaruktis* included within his abovementioned calculations of Psts. (*i. e.* K. Ts. together with Kms.) of Apn. Mns..

and command over instruments, of instrument players. In course of time that gave place to more and more dependence upon instruments, and to less necessity of that great individual skill of each instrument-player. That brought in more and more artificiality in music, due to that greater and greater dependence of it, on musical instruments. Thus we see, that in periods subsequent to that of *Sangita-Ratnâkar*, instead of the antique system, mentioned before, of shifting (without any tempering of notes), in instruments, of the basic note and of the other notes relatively to that note, at will, the **positions of**

By deducting these *Punaruktis*, and also other Kms. not included within these *Punaruktis*, but included within the abovementioned Psts. of Apn. Mns., and also by deducting the Kms., from the Psts., mentioned before, of Pn. Mns., from his calculations for K. Ts. together with Kms., Sârangadeva has arrived at the figures for the total nos. of *Purna* and *Apurna Kuta-Tânas*. If we follow from S. R., these calculations of Sârangadeva, step by step, with the help of both the commentaries by Sinhabhupâla and Kallinâtha, and also with the help of the illustrations, similar to those of mine, as exemplified above, these Sârangadeva's calculations of, and also his calculated figures for, the nos. of Pn. and Apn. K. Ts., and also the corrections to these figures, as given by Kallinâtha in S. R. Poona I, iv, 57-59 commt., would not be very difficult to understand. By these calculations, Sârangadeva has arrived at figures for thousands of K. Ts.. These, no doubt, were their theoretically possible numbers and not of the Kuta-Tânas actually in practice. From above *Punarukti* calculations of Sârangadeva, it would be seen, that while he has considered pa (*i. e. trisrutih* pa) of Madhyama-Grâma to be different form pa of Sdj.Gm. (*i. e.* from *suddha*-pa), he has not so considered dha (*i. e. chatuhsrutih* dha) of Mdm. Gm. to be different from, but has considered that to be the same as, dha (*i. e. suddha*-dha) of Sdj. Gm.. This non-differentiating by Sârangadeva, of *chatuhsrutih*-dha, in these *Punarukti* calculations, is what has been spoken of by Sòmanâtha, in support of his (*i. e.* Sòmanâtha's) non-differentiating of the five ancient *vikrita* notes, from their pairs, as mentioned before by me. From these *Punarukti*, as well as a-g and k-n Bhds. calculations of Sârangadeva it can also be seen, that he has not also differentiated in these calculations, *Achyuta-sa* from *suddha*-sa and *Achyuta*-ma from *suddha*-ma.

I have already said that the illustrations of mine, some of which I have exemplified above, may be assumed to be correct, on account of the fact that these illustrations fit in well with the abovementioned calculations. From that it may also be assumed that the **notes of different saptakas** as exemplified in these illustrations, **formed parts and parcels of,** and were attached to, these **Purna and Apurna, Moorchhanas, Kramas, and Kuta-Tanas.** From this, it can be seen, that Sârangadeva, in these calculations, besides assuming pa of Mdm. Gm. to be a differentiating factor, has differentiated, Kms., and K. Ts. formed of the same combinations of the same named notes, on the basis of notes of different saptakas, *e. g.* in above illustrated calculations, Sârangadeva has taken the Kms. and K.Ts. formed of the Apn. Mns. RG, GM. of Sdj. Gm., to be different from the Kms. and K. Ts. formed of the Apn. Mns. rg, gm respectively of Mdm. Gm..

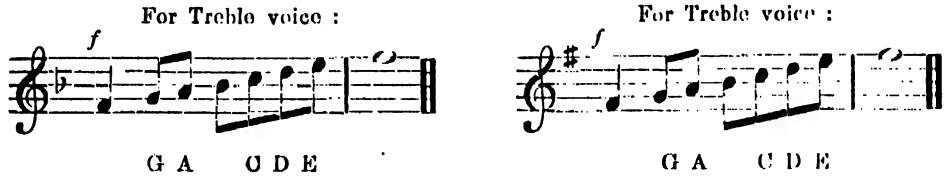
Similar to that done by Sòmanâtha, as spoken of above, Sinhabhupâla, while explaining Sârangadeva's texts regarding calculations of K. Ts, has also spoken of Sârangadeva's non-differentiating in these calculations, dha of Mdm. Gm. from dha of Sdj. Gm. and Sinhabhupâla has also, while explaining Sârangadeva's texts about the ancient twelve *vikrita* notes, spoken of *Achyuta*-sa to have had been of the same sound as that of *suddha*-sa, and he has given the reasons as to why that dha of Mdm. Gm. and that *Achyuta*-sa had been considered *vikrita*, as follows :—

"ननु यथा पञ्चमो ग्रामद्वये भेदकश्चतुःश्रुतिकत्वात् त्रिश्रुतिकत्वाच्च तथा चतुःश्रुतिकत्वात् त्रिश्रुतिकत्वाच्च धैवतः कथं भेदको न भवति ? ब्रूमः । यद्यपि धैवतः षड्जग्रामे त्रिश्रुतिर्मध्यमग्रामे च चतुःश्रुतिस्तथापि स्वस्थानं न परित्यजति केवलन्तु मध्यमग्रामे पञ्चमान्त्यश्रुतिग्रहणमात्रम् । ततश्च यदा पञ्चमसहचरितस्तथैव उच्चार्यते तदैव तस्य विकृतत्वप्रतीतिर्नान्यदेति न किञ्चिदेतत् ।..."(S. R. Cal. I, iii, 55-56 commt.). " ...निषादस्य काकलीत्वे पूर्वश्रुतिद्वयहीनत्वात् अच्युतः (षड्जः) स्वस्थाने चतुर्थश्रुतौ स्थित एव विकृतो भवति । ननु स्थानस्थितस्य पूर्वश्रुतिद्वयहीनत्वेऽपि ध्वनिविकाराभावात् कथं विकृतत्वम् ? उच्यते । यद्यपि पूर्वश्रुतिहीनत्वे तत्स्थानस्थितत्वात् ध्वनिविकारो नास्ति तथापि निषादस्य स्वस्थानस्थितत्वे चतुःश्रुतित्वात् षड्जस्य आयतत्वं भवति । यदा काकलीत्वे निषादः षड्जस्य द्वितीयश्रुतौ तिष्ठति तदा द्विश्रुतित्वात् अनायतत्वं प्रतीयते । तस्माद्भवत्येष विकृतः । ...." (S. R. Cal. I, ii, 38 commt.), *i. e.* 'Question. As pa happens to be the differentiating factor in two grâmas through being of four-*srutis*, also of three-*srutis*, likewise through being of four-*srutis* (and) of three-*srutis* why dha does not be (the) differentiating factor ? I tell (in answer). Though dha in Shadja-grâma (be of) four-*srutis*, yet it forsakes not (its) own place, only in Madhyama-grâma (be its) taking only of the last *sruti* of pa. For that reason also, when gathered together (*i. e.* grouped with) pa, (dha) in that manner indeed, is caused to be uttered (*i. e.* vocalised). At that time indeed (be) its acknowledgment of *vikrita*-function ; not in other occasions (*i. e.* when not grouped with pa) thus a little (be) this....." (*ibid.* S. R. Cal. I, iii, 55-56 commt.). "....In *Kâkali*-function of ni, *Achyuta*(-sa, lit. not-displaced-sa) through deprivation of (its) previous two srutis, being placed indeed in (its) own place in (the) fourth sruti, do be *vikrita*. Question. Of (sa as Achyuta-sa) situated in (its) place, even in deprivation of previous two *srutis*, through (*i. e.* though there be) want of change of sound, in what manner (be its) *vikrita* property ? (It) is spoken (in answer). Although in deprivation of previous srutis, therein, (though) through situation

notes on instruments were practically **fixed,** and we find from sanskrit books on music of that period, up to that of the 17th century A. D. that these fixed positions for notes were **on the basis of tuning on the basis of sa** and of Shadja Grâma. The practical disuse of Madhyama Grâma and of the use of only Shadja Grâma, as we find mentioned in books of that period (vide R. V. I, 41 and commt., and *Râgamâlâ* by Pundarika Viththal, Nirnaya Sâgar Press, Bombay, 1914, at p. 3), and in that subsequent period, the use, in theories of Râgas, of that Shadja-grama only,

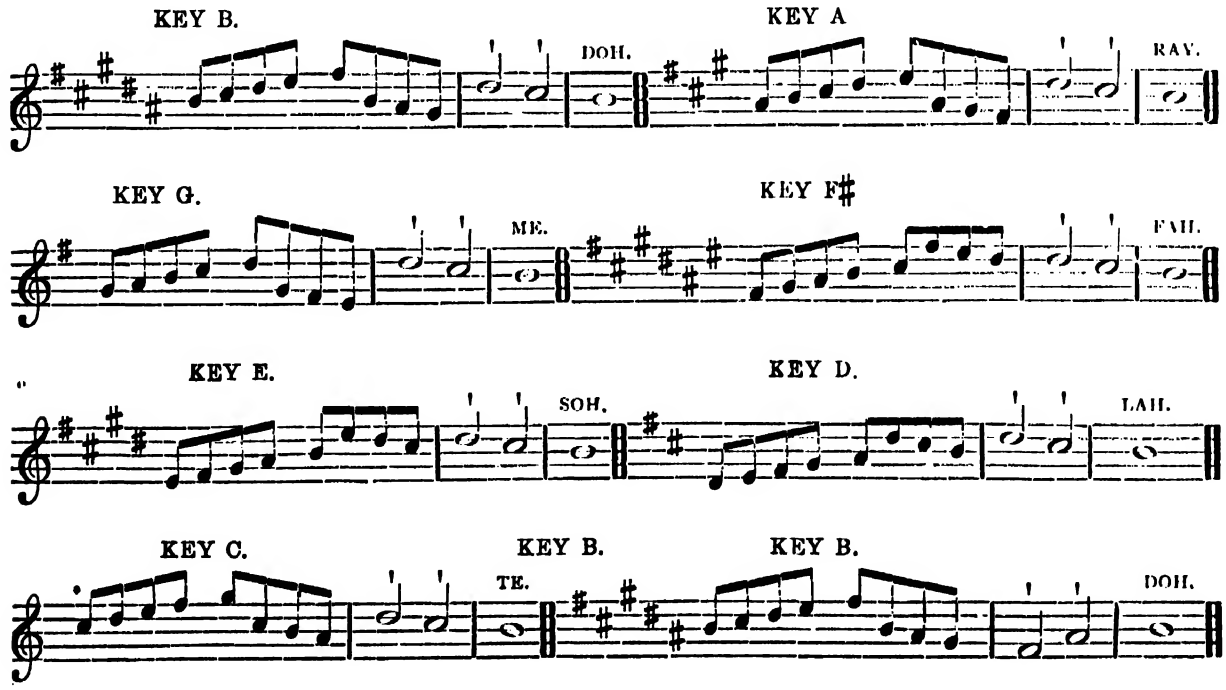
in place, (there) be no change of sound, nevertheless, in situation of ni in its own place (as suddha-ni), through (sa) being four-*sruti*-ed, (there) be largeness of dimension of sa. When in (ni's) *Kâkali*-function, ni stays in the second sruti of sa, at that time through (sa) being two-*sruti*-ed, the property of non-largeness of dimension (of that sa *i. e.* of *Achyuta*-sa) is manifested. Therefore (*Achyuta*-sa does) be indeed *vikrita*....." (*ibid.* S. R. Cal. I, ii, 38 commt.). Sinhabhupâla indeed speaks in above, about *Chatuhsrutih*-dha and *Achyuta*-sa, such apparent but not real change of sound of a note, through its altered relationship of intervals with neighbouring notes as is recognised in modern European music, *e. g.* as that spoken of in the following : –

".....in the two scale passages here given.....the five notes indicated by their letter names –G, A, C, D, E—are exactly the same in pitch, intensity, quality, duration, and accent; yet they produce quite a different effect upon the ear because of the altered relationship which is effected by the change of key-signature :—



"In the same way the same person may appeal to us differently as we regard him in his various social relationships—as father, son, husband, brother, uncle, cousin, friend, enemy, &c.". (*Text Book of Musical Knowledge*, Advanced Junior Division, by C. W. Pearce, Trinity college of Music, London, Ch. I, p. 9).

"Let any one satisfy himself...by trying the following experiments on the violin, or even the piano or flute. Let him try to appreciate and describe in his own words the mental effect of each note in the scale. He will find that even the same sound, as to absolute pitch, is altered, in its mental effect, by the 'Key relationship,' which may fill the ear before it is heard—just as a colour is improved or injured, in its mental effect, by certain other colours which may be placed by its side.



(From)"—**A Grammar of Vocal Music** by John Curwen, 26th edn. 1866, at Intro. p. xlvi (This book is long out of print). **The last note of each of the above passages (if these passages be played, as spoken above), in the violin, flute or piano, would be, especially in the latter instrument, of the same absolute pitch, yet that last note of each, in these different passages, would appear to the ear to be of different pitch and of different mental effect. I shall now speak of *Tânas*.**

with, besides the seven *suddha* notes of that Grâma, some ancient, and also additional, *vikrita* forms of these *suddha* notes, totalling, for purposes of, and to suit the requirements of different Râgas, five or more such *vikrita* notes, and the use (instead of different Grâmas and Moorchhanâs), of different *Melas*, formed of, either these seven *suddha*, or of different numbers of these *suddha* and *vikrita* notes, for purposes of modes of Râgas, as we find described in these books of the the abovementioned period, were, it may easily be inferred, the results of the abovementioned fixing of notes on instruments. Due to that system, of use of Shadja Grâma only, and of extra *vikrita* notes of that period, larger numbers of frets for *vinâs*, compared with numbers of frets of *vinâs* described in S. R., were necessitated and provided

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TANAs (SHADAVA or AUDAVA). I have spoken before (at pp. 84, 88 notes &c.) about *Tânas*, also termed *Suddha-Tânas* (see *ibid.* p. 84 notes and vide also S. R. Poona I, iv, 71), and that these were either *Shâdava* or *Audava* forms of *Suddhâ-Moorchhanâs*. In that connection I have mentioned (at p. 88 notes) that these Suddhâ Moorchhanâs and Tânas were composed of suddha notes only. By these 'suddha notes' obviously (as would appear from what I had said at p. 84 notes), I meant 'unaltered grâma notes.' Dattila has spoken of these *Tânas* as *Shatsvarâh* (*i. e.* six-noted) and *Panchasvarâh* (*i. e.* five-noted) *Moorchhanâs*, and also as these noted *Tânas*, and he has very briefly spoken of the particular two notes and one note omissions in, and the total numbers of, each of these two varieties, in both grâmas (vide Dattila pp. 3—4, verses 20, 25, 30—35), Matanga, by terming both these varieties as Shâdava and Audava Moorchhanâs as well as Tânas respectively, has, in course of elaborating the abovementioned descriptions of Dattila, has spoken in more detail of the same, and besides these, amongst other functions, has mentioned the names of each, of these Shâdava and Audava Tânas of both grâmas (vide Brhaddesi pp. 22, 24—28). Sârangadeva, by terming these as Tânas, has spoken in more detail about their notes-omissions, numbers, names &c. in S. R. Cal, I, iii, 26—30, 68—81; *sc.* S. R. Poona I, iv, 27—31. 71—88. Some of the abovementioned texts of Dattila and Matanga are to be found quoted in S. R. Cal I, iii, 19 Commt. (portions of which commt. have been quoted before by me at pp. 84 and 88 notes), and there are serious errors and omissions in the readings of each. By comparing the readings of these with each other and with the contexts of abovementioned S. R. texts, much of what Dattila and Matanga have said in these texts may be cleared up. As an example of the errors in these readings, I may mention here, that for the reading "मूर्छना तावतिथ्येव तद्ग्रामे षाडवौडवौ" of Dattila's text quoted in S. R. Cal. I, iii, 19 Commt. (quoted before by me at p. 84 notes), the reading in abovementioned Dattila at p. 3, verse 21 is, "मूर्छना तावतिथ्येव तद्ग्रामवत एव तौ". From these readings it would be seen that there are, (as suggested before by me at p. 84 notes, at the time of writing which, I had not seen the above Dattila) actually errors in the former reading, and that the latter reading supports the explanations of that and connected Dattila's texts given by me in that connection (at p. 84 notes).

Nos. and Structure of TANAS. By comparing the abovementioned Dattila's, Matanga's, and Sârangadeva's texts in the manner spoken of above, we may find that all of them have spoken of the same particular two notes and one note omissions in, and the total numbers of Tânas respectively of both grâmas. Sârangadeva has spoken of these as follows:—From each of the seven (seven-noted suddhâ-) Mns. of Sdj. Gm. through omission of either sa, or ri, or pa, or ni, total 28 *Shâdava Tânas* of this Gm., and through omission of either, both sa and pa, or both ga and ni, or both ri and pa, total 21 *Audava Tânas* of this Gm., and from each of the seven (seven-noted *suddhâ*) *moorchhanâs* of Mdm. Gm., through omission of either sa, or ri, or ga, total 21 *Shâdava Tânas* of this Gm., and through omission of either, both ri and dha, or both ga and ni, total 14 *Audava Tânas* of this Gm, altogether 49 *Shâdava* and 35 *Audava*, and in all 84 *Tânas* of both Gms.. Matanga in his tex'ts, as mentioned above, by terming these as *Shâdava* and *Audava Moorchhanâs* or *Tânas* has, mentioned the same one or two notes omissions of them respectively. It would be seen, that although sa could be omitted, yet **ma was not a omitted note, in any of these SHADAVA or AUDAVA MOORCHHANA or TANA.** That these included the notes of different *Saptakas* of their original *Moorchhanas*, may be assumed from the following Matang'a text,—"Question. In the first and the seventh *Moorchhanâs*, in sa being omitted, (there) be ri ga ma pa dha ni, this same form indeed. What is there the difference? True (there) is no difference, but difference of being made *mandra* (*i. e.* of comparatively lower *saptaka*) and *târa* (*i. e.* of comparitively upper *saptaka*) does surely exist." (Brhaddesi at pp 29-30. These Matanga's texts, with some differences in readings are quoted in S. R. Cal. I. iii, 29-30 commt.. In above translations, I have compared and incorporated the readings of both). Obviously Matanga in above, means that the sa-omitted Shâdava Tânas from the first and seventh Moorchhanâs respectively, of Shadja-grâma, would be rgmpdn and RGMPDN respectively.

Apparent repetitions in TANAs. Even if we allot, in the abovementioned manner, to these Tânas, the notes of different saptakas of the original Mn. of each, similar to what I have shown in cases of K. Ts., we would come across apparent repetitions of Tânas in abovementioned calculation and enumeration of their numbers. *e. g.* of the, both ri and dha-less. Audava Tânas of Mdm. Gm., those from the second and third (7-noted suddhâ) Mns. of that Gm., would both be, gmp'ns. Similarly other Tânas, from amongst the abovementioned 84 Tânas of both Gms. would seem to be the same. Sârangadeva has neither spoken of these apparently similar Tânas nor of *Punaruktis* (*i. e.* repetitions) amongst the above 84 Tânas. Most probably these apparently similar *Tânas* had been enumerated, as shown above, and considered, as distinct *Tânas*, due to the expectations of their omitted notes, as would be seen from the possibility of *Alpa-prayoga i. e, Alpa* application of omitted notes as mentioned before (by me at p. 79 notes) and from Matanga's explanations and conclusions with regard to *Tânakriâ* in strings of which I shall speak next.

for in *vinâs* of that period, and generally most, but not all the *vikrita* notes of lower and middle *saptakas*, and generally no *vikrita* notes of upper *saptaka*, within the range of notes of these *vinâs*, as shown below, were provided with frets. Generally that range of notes of that period were, the same as that described for some *vinâs* with frets in S. R., and also as what are generally the cases in modern *vinâs*, *sitârs*, *esrâjas* &c., *viz.*, from ma or pa of lower *saptaka* to sa of middle *saptaka*, thence to ni of middle *saptaka*, to sa and ri and ga and in rare cases to one or two notes more, of upper *saptaka*, with provision, in some cases, for playing some more lower notes in one or two thicker strings. All the *suddha* notes, and generally most but not all the *vikrita* notes of lower and middle *saptaka*s and generally no *vikrita* note of upper *saptaka*, within that range of notes, were provided with frets. With the same sets of frets, some of these lower notes, and also some still more lower notes, were provided for to be played, by special one or more thicker strings, in some cases. In some of these books, elementary notations of some Râgas, and in

The text of Bharata about **'TANAKRIA in strings,'** quoted before by me (at p. 97 notes) from R. V. II, 39 commt., has been explained, discussed, and quoted (with some differences in readings) by Matanga in Brhaddesi pp. 28-30. In that connection, Matanga has quoted (in *ibid.*) a similar text of Dattila, about *Tânakria* in strings, and (Matanga) has (in *ibid.*) also quoted, explained, and discussed other texts, of Bharata, Dattila &c., on connected subjects. The Dattila texts quoted there by Matanga, are to be found with some differences in readings in Dattila p. 4, verses 36-37, and some of the abovementioned Matanga's texts including Bharata, Dattila &c., texts quoted there by Matanga (in Brhaddesi pp. 28-30) are to be found quoted with some differences of readings in S. R Cal. I, iii, 29-30 commt., and also in S. R. Poona I, iv, 18 commt.. There are, however, serious errors and omissions in the readings, of these texts in each of these books. Due to this and also due to the fact, that these texts deal with antique theories, practices, and technical terms, which we are not conversant with, these Matanga's texts, including Bharata &c. texts quoted there by him, are very difficult to understand and abstruse at places. By comparing, however, these readings in the abovementioned books with each other, and on reference to their contexts, much light can be thrown on the subject, and by following that method, and by incorporating the abovementioned different readings, I shall next explain some of the abovementioned Matanga's texts.

In these texts Matanga has explained the **two devices** *viz.* (1) *Pravesa* and (2) *Nigraha* devices of **TANAKRIA in strings**, and the two varieties, *viz.* 1 (a) *Viprakarsa* and 1 (b) *Mârdava* varieties of that (1) *Pravesa* device,' spoken of in Bharata's texts (quoted before, at p. 97 notes, by me, from R. V. II., 39 commt.), as follows: "(1a) *Pravesa* by *Viprakarsa* is *e. g.*, by *Viprakarsa* (*i. e.*) *Pidanam* (पीडनम् *i. e.* putting pressure upon, or tightening) of ri's anterior *i. e.* lower (and) omitted (svara) sa, up to (or up till) ri making thus. (ib) *Pravesa* by *Mârdava* is *e. g.* by *Mârdavam* (*i. e.*) *Sithilikaranam* (शिथिलीकरणम् *i. e.* loosening) of the very same (*i. e.* the abovementioned) sa (having the property of) being posterior (*i. e.* upper) of ni, up to (or up till) ni-making thus. (I have said before at p. 97 notes, that both these varieties of Pravesa, were, what is in modern music done in *Mir* process of playing. Most probably, the above Matanga's examples of both varieties of Pravesa, were, with regard to some notes of a sa-omitted Tâna, played on the fret for lower ni, or for some other lower note). In this manner (is) two kinds of *Pravesa*. (2) *Nigraha* is quitting the posterior (*i. e.* upper) *svara* (thereby) आस्पदं दर्शनं *i. e.* seing the object (*i. e.* thereby performing the desired svara), *Prayôga* indeed (is) as,—सासागरिपापापामारि (*i. e.*) sâ sâ ga ri pâ pâ pâ mâ ri." [The readings of the last two, of the above sentences, in abovementioned S. R. Cal. and Poona commts. are as follows:— "निग्रहस्तु उत्तर स्वरपरित्यागः। असंस्पर्शप्रयोगस्तु यथा सारगी। (*i. e.*) *Nigraha* is quitting the posterior *svara*. Non-touch *Prayôga* indeed *e. g.* sâragi." (S. R. Cal. I, iii, 29-30 commt.). "निग्रहस्तूत्तरस्वरपरित्यागः। असंस्पर्श इति यावत्। (*i. e.*) Nigraha indeed is quitting the posterior svara. (That is, it is) non-touch up to that." (S. R. Poona, I, iv. 18 commt.).] (Most probably by this Nigraha device was meant the not-touching, or non-stopping by the finger, a particular note). "So also says Bharata—" (here Matanga quotes the Bharata's text spoken of above by me, about Tânakriâ in strings. Thereafter Matanga continues,—) "Whence? Through indestructibility of *Madhyama* (*i. e.* middle-) *saptaka*, such is the significance." (Most probably this signified, the appearance in every ancient music, as is also the case in modern music, of some notes at least, of the middle-*saptaka*. Thereafter Matanga further elucidating the subject, continues,—) "Question, In three places (*i. e.* in three saptakas) *svara-prayôga* [(*i. e.*) application of svaras, (is to be)] that (is) spoken of. To those who doubt,(as to) कारीपिधाने तत्र कतम स्वरसप्तकमवलम्ब्य मूर्छना कार्येति ये संशेरते (*i. e.*) those who doubt, (as to) by taking support of which of these (three) saptakas of notes, *moorchhanâ* is to be done in *Kâripidhâna* (this *Kâripidhâna* and also *Kâruvindha*, spoken of afterwards by Matanga, in Brhaddesi at end of p. 31, probably signified some sorts of artistic phrases or passages or ornaments, or arrangement of notes for that purpose) towards (*i. e.* to) them says (Bharata or some other author, or Matanga himself in third person),—by *madhyama-saptaka* मूर्छना निर्देशः [(*i. e.*) indication of moorchhanâ (is to be made)] for proper accomplishment up to (the range of) *mandra* (and) *târa* (*i. e.* of lower and upper saptakas). By Dattila is also said,—(here Matanga quotes Dattila's text about Tânakriâ in strings, which is similar to abovementioned Bharata's text about Tânakriâ in strings). By Bharata is also said,—by *madhyama-svara* [(*i. e.*) (middle-)ma note (see below)] मूर्छना निर्देशः [(*i. e.*) indication of moorchhanâ, (do)] be, due to indestructibility of *madhyama* (*i. e.* of ma note) in *Nigraha* (*i. e.* in subduing *i. e.* omission of notes) or *Parigraha* (*i. e.* accepting *i. e.* using *i. e.* non-omission, of notes)." (This,

some, descriptions of playing of some Ragas note after note, with particular graces or ornaments on particular notes, are to be met with, and some of these books contain only theories, with no such notations or descriptions for playing of Ragas. These notations, however, are with the *suddha* notes signs स, रि, ग, &c. only, and the abovementioned descriptions, are either with the same signs, or with the *suddha* notes names षड्ज, ऋषभ, &c. only, and in none any special signs or descriptive languages for *vikrita* notes have been included. To understand these ancient notations and descriptions of play of Râgas of each book, the whole system and theory of *vikrita* notes, *Melas* &c. and particular *Melas* alloted to particular Râgas should be thoroughly understood from the theories spread over the whole bodies of each book, and therefrom, the *suddha*, or specific *vikrita* forms of each note, of each of these notations or descriptions of plays of notes, should be alloted to each of these notes. In any attempt to transpose these notations &c. to some modern notation, and to understand these ancient theories of Ragas in modern terms, not only the abovementioned specification of each *suddha* or *vikrita* form of each note should be done, but also the corresponding modern pitch values, in terms of that modern notation, of, besides the ancient seven *suddha* notes, of each *vikrita* note, of the system of each of these books, should be found out, and the corresponding signs in terms of that modern notation should be alloted to each of these ancient notes, both *suddha* and *vikrita*. Not having understood in this manner, **Sir William Jones, and** in course of correcting him, **Mr. Fox Strangways had made some fallacies,** as shown below **in transposing a notation of Raga-Vibodha.***

no doubt, signified the non-omission of ma-note, spoken of before by me, in any Shâdava or Audava Moorchhanâ or Tâna. Thereafter Matanga continues,—) "Question. Does (a) recognising sign towards *moorchhanâ* exist or not in *Shâdava* or *Audava* being made? In this manner (being made) recognising sign towards moorchhanâ surely does exist, and so says Dattila,— 'Even so being done in Tâna-function (*i. e.* a Moorchhanâ being made shâdava or audava in case of a Tâna), by counting (*i. e.* by taking account of) the destroyed (*i. e.* omitted, one or two notes, from the original moorchhanâ) this (original) moorchhanâ, does exist, that far, in this manner should cause to ascertain' (*i. e.* in this manner, the original moorchhanâ and its range of notes, should be recognised). (Thereafter, further discussing the subject, Matanga gives his opinion that the word *madhyama*, in 'moorchhanâ-indication by madhyama-saptaka' and in 'moorchhanâ indication by madhyama-svara' of above texts, signified both ma-note and middle-saptaka. Thereafter Matanga adds—) कार्ये स्वरे मूर्छना कार्येति भावः। वैणग्रहणं च शरीरे अप्रकीर्तितः (र्तितं ?) तस्यापि स्थानस्य लाभार्थम्।" [(*i. e.*) "in the note that is worth hearing (*i. e.* that would be heard) *moorchhanâ* is to be done, that is the significance. The taking of vinâ in body (has) also not been spoken of, for the sake of attaining of place (*i. e.* different saptakas) of that (*i. e.* in vinâ) also (the abovementioned moorchhanâ-indication by middle-ma is to be, that also is to be understood)."]. (Brhaddesi pp. 28-29. In above, the portions within brackets, are explanatory notes of mine).

The above lead to the view that Matanga in these texts concludes, that the abovementioned Bharata, Dattila &c. texts quoted there, by Matanga, had signified **the antique theory and practice, of moorchhana-indication by middle ma note** both in vocal and stringed-instrumental music, for the sake of the attainment up to the range of three (*i. e.* lower, middle and upper) *saptakas*, and of the recognition, for this purpose, in case of a *Shâdava* or *Audava Tâna*, of the original *moorchhanâ* of that *Tâna*, and that (in Matanga's opinion, the abovementioned) *Pravesa* and *Nigraha* devices for *Tânakriâ* in strings were due to, that antique theory and practice.

The abovementioned theories about *Purnâ Moorchhanâs* and also *Shâdava* and *Audava*, *Moorchhanâs* and *Tânas* and about *Tânakriâ* in strings, lead to the conclusion, that amongst the applications of *Moorchhanâs* and *Tânas* already spoken of by me, and of other applications and functions of these had there been such, **in ancient Indian Music, GRAMAs and PURNA-MOORCHHANAs were used as heptatonic modes, and SHADAVA and AUDAVA MOORCHHANAs and TANAs were used as hexatonic and pentatonic modes respectively,** and that the one or two notes omissions in the latter two modes, could be those only, that have been mentioned before by me, with regard to (suddha-) *Tânas*. From the ancient theories, mentioned above, it will also be seen that *trisrutih*-pa only (and not *suddha*-pa), appeared in *Madhyama-Grâma* and *Moorchhanâs* and *Tânas* of that *Grâma*, and that *suddha*-pa only (and not *vikrita* or *trisrutih*-pa), appeared in *Shadja-Grâma* and *Moorchhanâs* and *Tânas* of that *Grâma*, and that the (Suddha) *Tânas* were formed out of their original *Grâma* notes only, without inclusion of any other *vikrita* note, and that, in both *Shadja* and *Madhyama Grâmas* and *Moorchhanâs* of both, the only other applications of *vikrita* notes could be,—*Antara* (*i. e. Antara-ga*) or *Kâkali* (*i. e. Kâkali-ni*) or both, in place or places of *suddha*-ga or *suddha*-ni or both, respectively.

*Sir William Jones got that notation from a Mss. copy of R. V., and Mr. Richard Simon's book, mentioned below, which has been referred to by Mr. Fox Strangways, being published long after Mr. Jones, could not be available to him. The notations of Râgas (excluding explanations in commentaries annexed to them, spoken of below) of *Râga-Vibôdha* have been reproduced by lithograph, after corrections and insertions of different readings, from two manuscript copies of that book, by Mr. Richard Simon of the University of Munich, in his "*The Musical Compositions of Somanâtha*" (Otto Harrassowitz, Leipzig, 1904, pp. 33 and Preface &c.). Mr. Simon has done this reproduction of these ancient notations, very carefully. The same author, in his paper,—Die Notationen des Somanâtha (Sitzungsberichte der K. Bayer. Akad. d. Wiss. 1903 p. 447—69, sold seperately, with 2 photographs of 2 leaves of the

The abovementioned finding out, of the particular *suddha* and *vikrita* notes of each *Mela* &c. of each of these ancient books, from the theories in each, is a very difficult task, requiring much patience, diligence and perseverance, but the **allotment of modern pitch values to** each of **these ancient Melas and notes** thereof, **would** often turn out to **be a very formidable task**, due to the fact that the theories of these ancient books have been given in terms of *srutis* in the system of 22 *srutis* within an octave, and although like the system of modern 22 *srutis*, as spoken of before by me (at p. 21 notes), these ancient *srutis* might be assumed only as rough measures of intervals, with unequal values, in different cases, of one *sruti* (interval) measures, and though in that ancient system, like that spoken of before (in *ibid.*), notes 2, 3, 4 *srutis* apart, might be assumed as just,—semitone, minor, and major intervals apart, respectively, yet that could not be done in every case, and that besides these 2, 3, 4 *srutis*, notes 1 *sruti* apart, appeared, in some *Melas* of some of these ancient books, and that the value of one *sruti*, was not only different,

Bombay manuscript, by G. Franz, Munich) has discussed and explained the notations employed by Somanâtha and their technical correspondence to the vinâ &c.. Not being able to procure it, I have not yet seen that article in that paper. The whole book Râga-Vibôdha, including its notations of Râgas and explanations to these notations in their commentaries, (with, as in these commts., I, 2, 3, 4, 5, 6, 7 numbers for the signs for notes sa, ri, ga, ma, pa, dha, ni respectively, and abbreviated initial syllables of the names of the signs employed by Somanâtha for graces, ornaments &c., annexed to these note numbers) have been printed in the Poona edition of Râga-Vibôdha. In that printed R. V., however, although the texts and commentaries, which are in Sanskrit, have been very carefully and diligently edited, and also carefully printed, yet, the notations and their abovementioned commts. and also the signs for notes and graces and ornaments &c. in these and also in other places, have been very carelessly printed, and rude substitutes have also been given for these signs, resulting in serious errors transpositions and misrepresentations in several places. Sir William Jones had made the abovementioned transposition in the following manner.

In his article,—*On the Muscial Modes of the Hindus* [Originally written in 1784 and since then much enlarged, and published in the *Asiatic Researches*, and reprinted in *Hindu Music From Various Authors*, compiled by (Rajah) Sourindro Mohun Tagore, Stanhope Press, Calcutta, 1875, at Part I, pp. 123—160 (long out of print)] Sir William Jones has given near end of that article, (at pp. 158—159 of above reprint) a facsimile reproduction of the notation of (Râga) *Vasanta*, (without its commentary, mentioned below) from a Mss. copy of *Râga-Vibodha*. Taking that notation as the standard tune of *Râga-Vasanta*, Sir William Jones has composed and given a music of the song, named below, in staff-notation, in the following manner. He has added time-values and rhythm to the notes of the above original R. V. *Vasanta* notation, which like other notations in R. V. bear no time-values, but have signs for the three *saptakas*, ends of strains and of sections and of sub-sections, and for various graces, ornaments &c., attached to these notes. By giving these time-values and rhythm of his own composition, suiting the syallables of the words of that song (named below), and by transposing the signs for notes, [which in the original R. V. notation (as in the case with all other R, V. notations for other Râgas) is with the *suddha* note signs, स (sa), रि (ri), ग (ga), म (ma), प (pa), ध (dha), नि (ni) only (without any special signs for *vikrita* forms of these notes)] as he has said (in *ibid.* reprint p. 158), "in the major mode of A, or sa" *i. e.* as comparatively shown by him in staff-notation (in *ibid*, reprint p. 159) in Key A-Major, with the staff-note signs for the European notes A B c-sharp d e f-sharp g-sharp a, for the abovementioned note signs for sa ri ga ma pa dha ni *sa* of the original R. V. notation respectively, and in this manner he has given a music, in staff-notation in Key A-Major, together with the words divided into syllables, transcribed in English, of the song *Lalitalavanga latâ* of the book *Gita-Govinda*. That song, as its author, the celebrated religious poet, Jayadeva, in that book of his says, is in Râga *Vasanta*. Mr. Jones has neither mentioned the graces and ornaments &c. of the original R. V. notation, nor has he transposed them in that staff-notation music of his, and excepting saying that, amongst other modes (*i. e.* Keys) that "major mode of A" suited the feelings of that song, and that "the number of notes in Sôma (*i. e*, in above original notation in R. V., of Sômanâtha) compared with that of the syllables in the *Sanscrit* stanza (*i. e.* of above song), may lead us to guess, that the strain itself was applied by the musician (Sômanâtha) to the very words (of that song) of the poet (Jayadeva)" (*ibid.* reprint p. 158), Sir William Jones has neither given any reasons for the time-values and rhythm added by him to the R. V. notes, nor has he assigned any reason for his adopting the series of intervals of the above series of European notes of Key A-Major, for the note signs sa ri &c., respectively, of the original R. V. notation. The original R. V. notation was not intended for, as will be shown below, any particular rhythm or time-values of its notes and Sir William Jones, from the *Suddha* note signs of sa ri ga &c., of that notation, most probably thought all of them to be *suddha*, and from their similarity with the note signs for *suddha* notes, sa ri ga &c., as spoken of before by me (at pp. 97-98 notes), of modern Hidysthâni music, he probably thought the *suddha* notes of the same signs of both, were the same, and from the fact that he found, as spoken of before by me (at p. 6 notes) that the Indian (*i. e.* modern Hindusthâni) Scale and the European (*i. e.* the European just natural) Scale were not different, Mr. Jones, probably alloted the series of intervals of that European Key A-Major Scale, which most probably he had taken as a just natural scale, to the note signs sa ri ga &c. respectively of the original R. V. notation. This transposition, of his, had he done so on that assumption, was, as shown below, fallacious. In any case he has not mentioned anything about the particular *vikrita* forms of particular notes of that original R. V. notation.

Mr. Fox Strangways, after mentioning abovementioned Mr. Simon's book, and taking help no doubt from that book, has given his own transposition in staff-notation of that R. V. *Vasanta* notation, (in his *Music of Hindostan*, at Ch. VII., p. 187) in the manner spoken of below. In that connection Mr. Fox Strangways, has said,—"this particular one (*i. e*, R. V. *Vasanta*

but also different, in different cases and *Melas*, of the self-same book, and that these books do not give any values of these 1, 2, 3, 4 &c. *srutis* in terms like those of modern scientific values. I have spoken in detail, in the *Parisishta* to Vol. I of this book (Gita Sutra Sâr) about the theories besides of the ancient *suddha* notes and the modern values that can be alloted to them, of the *vikrita* notes and *Melas* &c. and the *suddha* or *vikrita* notes included within these *Melas* &c., and the numbers of frets in *vinâs* alloted to notes, in some of these ancient books, and I have also discussed and explained with such proofs as were available, about the modern equivalents, in terms of modern notations, that may be alloted to the ancient *Shadja* and *Madhyama Grâmas* and to the notes thereof, and to some *Moorchhanâs* and also to some *Melas* and *suddha* and *vikrita* notes thereof as were to be found in books of the abovementioned ancient period, and also as to how attempts might be made to find out the modern values of other *Melas* and *vikrita* notes of these books. Thinking. however, that it may be of some help to those, not conversant with Bengali, in which language that *Parisishta*, has been written, who may wish to pursue the subject, I shall mention here only some of these theories of a few of the books of those periods.

notation) was curiously, misinterpreted in Sir William Jones's article, [(*i. e.* in) *On The Musical Modes of The Hindus*] in the *Asiatic Researches*, and has been so reprinted by others. It was written out in an ordinary Major Key (A Major); no hint was given of a *gamak* [(*i. e.*) graces. ornaments &c.] from beginning to end....." (*ibid.*). Mr. Fox Strangways has thereafter quoted, terming it *Pseudo*-Vasanta, the abovementioned notation of Mr. Jones, of the song *Lalita-Lavangalatâ* (in *ibid.* p. 187). In his own transposition, mentioned above, of R. V. *Vasanta* notation, however, Mr. Fox Strangways has himself made many errors, omissions and fallacies, as I shall now show.

Although Mr. Fox Strangways has transposed in that transposition of his, the signs for *gamak* (*i. e.* graces, ornaments &c.) of the original R. V. notation with signs of staff-notation, yet he has neither transposed nor given any hints for some of the signs of the former *e. g.* that for *pluti* (which is explained below and which is still to be seen played in *Sitârs* &c.). Mr. Fox Strangways probably had not properly understood that, and such other signs. Regarding other signs for graces &c. such as those for *âhati*, *pidâ*, *gharsan* &c., of the original, which, as explained below represent *mir*, gliding &c., that can only be properly played in such long stringed instruments with frets, such as Indian *vinâs*, *sitârs* &c., and for which there are no equivalent signs in staff-notation, Mr. Fox Strangways has given for these signs, rough and rude substitutes taken from the staff -notation. These original signs represent various grades of intermediate sounds passing from the sound of one pitch to that of another, by which a Râga is properly expressed, and the improper representations, by substitutes, of these signs, by Mr. Fox Strangways in his transposed notation, has, no doubt, distorted to some extent, the original R. V. notation, similar to what has been done in Mr. Jones's transposition, by omission altogether of these signs, as spoken above. Regarding the notes, Mr. Fox Strangways, without mentioning the *Mela* of R. V. *Vasanta*, has spoken of its notes as,—'It is the F—f scale with the G flattened: the C is lightly touched, and the salient notes are A and E, which it will be noticed alone bear the trill; the D of this *Râg* is generally held to be natural, but is sometimes given as flat" "(see the list of *Râgs* on p. 151, though it differs in some particular from each of the versions there given)." (*Music Of Hindostan*, VII, 166). By saying this, Mr. Fox Strangways in his transposed notation, has transposed the signs for sa ri ga ma pa dha ni *sa* of the original R. V. notation, with the staff-notation signs for the European notes F G-flat A B c d e f respectively. In that p. 151 of his book referred to by him in above, Mr. Fox Strangways, by substituting the modern Hindusthâni notes sa ri ga ma pa dha ni, by the staff-notation signs for C D E F G A B respectively, and the *kômal* and *kari* signs for *vikrita* forms of the former, by flat and sharp signs of the latter, has given the Gwâlior, Poona, Gujarât and Calcutta versions of the *Thâts* of several Hindustâni Râgs. There, amongst these, he has given of the *Thât* of *Vasanta*, (spelled there by him Basant and also Basanta), the Gwalior version, as:—C D-flat E F F-sharp G A-flat B c, and its Poona version, as,—C (D-flat omitted) E F-sharp (G omitted) A-flat B c, and of its Gujarât version as,— C D-flat(trilled) E F F-sharp A(trilled) B c. The Bengali version, according to the author of Gita Sutra Sâr, of the *Thât* of that Râga *Vasanta* is, sa ri-*Kômal* ga ma *Karmi*-ma (pa omitted) dha ni *sa i. e.* the same series of notes as of the abovementioned Gujarât version. From the above, it will be apparent, that Mr. Fox Strangways, had assumed that the *suddha* note signs for sa ri ga ma pa dha ni of the original R. V. notation, were the signs for the notes of the same pitch values as of the modern Hindusthâni notes sa ri-*kômal* ga ma pa dha ni respectively, *i. e.*, as spoken of by him, as shown above, practically the same as the modern Hindusthâni *Thât* of *Râga Vasanta*, though not exactly alike in detail, with any of its three versions as detailed by him. In this transposition of notes, Mr. Fox Strangways, had made a fallacy,—and, on the other hand,—in spite of its defects, Sir William Jones's transposition of notes was a very close approach to the original (as would appear from what I shall next show), though that closer approach might have been merely by accident, unsuspected and unrecognised by Mr. Jones.

Sômanâtha, has mentioned, that, although he has given signs for *suddha* notes sa ri ga ma pa dha ni only, in his notations, yet, the *suddha* or particular *vikrita* forms of each of the seven notes, in the notation of each Râga, should be recognised from the *Mela* of that Râga (R. V., V, 30) and that although he has shown in the notation of each Râga, its range to lower and middle *saptakas*, with prominence given to the middle *saptaka*, in spite of that, each of these Râgas should, as far as practicable, be played in similar forms as shown in its notation, in various ways, with prominence given to one or more lower or upper *saptakas*, ranging to the immediate lower and upper *saptakas* of that prominent *saptaka* (R. V., V, 167 and commt.) and that each Râga has possibility of many varieties of forms (*ibid.* 168). No particular rhythm or time-values for notes, nor the music of particular

In *Sangita-Pârijata*, *Moorchhanâs* as well as *Melas* have been applied in theories of Ragas, and in this book, besides for the seven *suddha* notes, theories of 22 *vikrita* notes have been given, one or more

songs were intended by Sòmanâtha in these notations of his, in R. V.. Each notation of each Râga, was no doubt meant for representing a form of that Râga, and the time-values for notes, were no doubt left, like those of modern *Âlâpas* to the judgment of the player, suiting the feelings and expressions of each Râga, and the taste, feeling &c. of the player gathered from his experiance, and habituated and accustomed knowledge of that Râga. Regarding the *suddha* or *vikrita* notes of above R. V. *Vasanta*, we find from R. V., that the *Mela* of its Râga *Vasanta*, as spoken of, together with its notation, in R. V., V, 46-47 and commts., and also in R. V. III, 38 ; IV, 12 commt., was *Vasanta Mela*, and that of that *Mela*, the notes sa ri ma pa dha were *suddhas* and both the notes ga and ni were *vikritas*, being *antara*-ga and *kâkali*-ni respectively (R. V. III, 38 and commt.), *i. e.* of that R. V. *Vasanta* notation, amongst the signs for seven notes, the signs for sa ri ma pa dha should be taken as representing these *suddha* notes respectively, and the signs for ga and ni should be taken as representing the *vikrita* notes *antara*-ga and *kâkali*-ni respectively. I give below, in a comparative table, that *Vasanta-Mela* with *sruti* intervals of its notes as gathered from theories in R. V. Ch. III, with two alternative corresponding series of Modern European Tonic sol-fa notes suggested by me, and also with the abovementioned transposed series of notes of Mr. Jones and of Mr. Fox Strangmays.

Raga-Vibodha VASANTA MELA, and suggested corresponding modern notes.

R. V. *Vasanta Mela* notes	...	sa	3	ri	4	*antara*-ga	2	ma	4	pa	3	dha	4	*kâkali*-ni	2 *sa*
Corresp. notes suggested by me		d	8	rah	9	m	5	f	9	s	8	l	9	t	5 d^1
Do. alternatively	...	s	8	l	9	t	5	d^1	9	r^1	8	m^1	9	fe^1	5 s^1
Mr. Jones's transposition	...	A	1	B	1	c♯	½	d	1	e	1	f♯	1	g♯	½ a
Mr. Fox Strangways's do.	...	F	½	Gb	1½	A	1	B	½	c	1	d	1	e	½ f

Modern Hindusthâni Râga *Vasanta Thât*, as given by the author (of G. S. S.) is :—

sa ½ ri-*komal* 1½ ga ½ ma and also (½ *kari*-ma ½ pa-ommitted 1) dha 1 ni ½ *sa*.

In above suggessions of mine, I have taken (similar to that suggested before, in connection with Hindusthâni *suddha* notes at p. 21 notes) the 4, 3, 2 *srutis* intervals of above *Vasanta Mela*, as 9, 8, 5 degrees (*i. e*, major minor, semitone) intervals respectively of Tonic Sol-fa notes intevals, of Mr. Curwen's system of 53 degrees within an octave (spoken of before by me at pp. 21, 22 notes). In the staff-notation notes of Mr. Jones's and Mr. Fox Strangways's transpositions, spoken of above only full-tone and half-tone and combinations of these two intervals only, are recognised. Similar **full tone and half-tone intervals only, are practically understood with regard to modern Hindusthani THATS which include VIKRITA notes. Modern Indian Musicians,** though they speak of *srutis* of modern Hindusthâni *suddha* notes, in the manner spoken of before by me (at p. 97 notes), **cannot so speak of the SRUTIs of its VIKRITA notes, and** where pressed, **they speak of the SRUTIS of these VIKRITA notes of the modern Hindusthani system, very loosely and indefinitely,** and in versions, differing in cases of different persons. In this Hindusthâni system of 7 *suddha* and 5 *vikrita* notes spoken of before by me (at pp. 80—81 notes), 5 full-tone intervals between sa-ri, ri-ga, ma-pa, pa-dha, dha-ni, and 2 half-tone intervals between ga-ma, ni-sa, with the five *vikrita* notes ri-*kômal*, ga-*kômal*, *kari*-ma, dha-*kômal*, ni-*kômal* inserted at half-tone intervals between the above five full-tone intervals respectively, similar to those of the European equal temperament system, are generally practically understood within an octave. In above, I have shown the full-tone and half-tone intervals as 1 and ½ respectively.

I give below, the abovementioned R. V. Râga-*Vasanta* notation, in the form given in its R. V. commentary, with English translations such as 'twice' &c. wherever possible, and other signs as noted below. In this, I have corrected that notation after comparing the different readings as found from Mr. Simon's book, mentioned above, and also from the printed R. V. notation and its commentary.

Raga Vasanta of Raga-Vibodha.

"This (is) *Vasanta* (shown in the R. V. notation just before this R. V. Commt.) in the manner sa ri ga (&c.). It indeed (is) in its own (*i. e. Vasanta*) *Mela*, as a matter of course, (and fit for performance) in morning time, (as) spoken of before (at R. V. III, 38 and commt, ; IV, 12 and commt., V, 2, 6, 10 and commts. &c.).

"s(*sa*) r a(*ka* twice, *sa*) m(*sa*) | d p(*sa*) m p(*sa*) m g(*ka* twice) m d m d k(*ka*) d d k(*â*, *ka*, *gh* †) *s*(*gh*) *s*(*sa*) ‖ *s m*(*mu*) *a*(*â*) *a r*(*gh*) *s*(*gh*) k(*gh*) *s*(*gh*) k(*gh*) d(*gh*, *sa*) m d | m d k(*ka* twice) d(*sa*) d k(*ka* twice, *gh*†) *s*(*gh*) *s*(*gh*) *s*(*sa*) k d p(*sa*) m p(*sa*) ‖ m a(*ka* twice) m(*sa*) m(*mu*) a(*â*) a(*gh*) r(*gh*) s(*gh*) ‖‖ *s*(*plu.* upper-*saptaka* ended. Most probably this signifies *pluti* up to sa of upper *saptaka*) k d p | m p(*sa*) m a(*ka* twice) m(*sa*) d p(*sa*) m p(*sa*) m a(*ka* twice) m(*sa*) m(*mu*) a(*â*) a(*gh*) r(*gh*) s(*gh*) ‖‖" (R. V., V, 46—47 and commts.). †These *gha* (*i. e. gharshanam*) syllables in above are affixed to these notes in the R. V, commt. but not so marked in the R. V. notation. These probably signified *gharshanam* from these to the next notes.

of these 29 notes being placed, in each of the 22 *srutis*. For purpose of theories of Râgas, however, besides 7 *suddha* notes, five only, out of these 22 *vikrita* notes, have been applied, and, besides frets for *suddha* notes,

In above, for the numbers 1, 2, 3, 4, 5, 6, 7 for the seven notes, as given in the R. V. commt., I have used s, r, a, m, p, d, k for these 7 notes, which are, as spoken above, the notes sa, ri, *antara*-ga, ma pa, dha, *kâkali*-ni of *Vasanta* Mela, respectively, as shown above. In the R. V. notation and commt. the notes of upper *saptaka* bear the mark named *kathina*, and the middle *saptaka* notes bear no such marks. In above I have shown the notes of these two *saptakas* with the above letters s r a m &c. in italics and Roman respectively, and have not separately shown any sign for *kathina*. The signs | and ‖ signifying no doubt ends of sub-sections and sections, are taken from the original R. V. notation, and for the lotus mark, signifying the end of a strain, of the original notation and commt., I have used in above, the sign ‖ ‖. I have shown in above, the other signs of the original notation, (which in the R. V. commt. are marked with abbreviated sanskrit initial syllables of the names of these signs), with abbreviations with English letters, within brackets, next to that note, which note is to be played in the one or more ways, as indicated by its one or more marks. These marks, as explained in R. V., V, 14-29, signify as follows :—

sa i. e. "*sama* happens to be slow,—A note expressively shown (and then) staying in silence is *sama*" (R. V., V, 22 and commt.) (*i. e.* broad and detached).

ka. i. e. kampa is vibrating the sound of the sounded note by quickly moving, slightly to and fro, twice or thrice, the stopped string over the fret (*ibid.* 19 and commt.).

â i. e. âhati. While the anterior (lower) note is sounding, without further stroke on the string, showing the immediately next or not-immediate (but some other) upper note is *âhati*. Similar playing in cases of the anterior and posterior notes being the upper and lower notes respectively, is also *âhati* (*ibid.* 17 and commt.). Such playing is performed in modern *Sitârs* &c. by sounding the anterior note by the ordinary method, and thereafter, sounding the posterior note, when that is the upper note, by merely stopping the aforementioned sounded string, over the fret for that upper note, and in case of the anterior note being the upper note, that note is sounded after stopping the string simultaneously by two left fingers, over the frets for both the notes, and thereafter the posterior (lower) note is sounded, by merely loosening that finger, which is over the fret for the upper note.

gh i. e. gharshanam signifies, with only one stroke on the string, sounding a note, and quickly thereafter, showing *i. e.* sounding by means of gliding (on the string by the left finger), its (consecutive) anterior (*i. e.* lower) or posterior (*i. e.* upper) notes or notes immediately next in sequence (*ibid.* 19 and commt).

mu. i. e. mudra signifies, with only one stroke on the string, sounding the posterior (*i. e.* upper note), then in slow time, after showing the anterior (*i. e.* lower) note, again by placing the finger (on the string) over (the fret for) the upper note, (thereby) covering up (that sound of) the anterior note (*ibid.* 20 and commt. This play is done in modern *vînâs*, *sitârs* &c. by sounding the upper note after simultaneously stopping the string by two fingers over the frets for these two notes, and thereafter, expressing the lower note and then the upper note, by releasing and again stopping the finger, from and over the fret for the upper note).

plu i. e. pluti. signifies, with only one stroke on the string, quickly producing 8 notes by gliding (*ibid.* 21 and commt.) *i. e.* as is done in modern *vînâs*, *sitârs* &c.,—immediately after sounding a note, without further stroke on the string, quickly sounding by gliding of the left finger over the frets, its next seven notes in sequence.

In the above notation, single notes would be seen to be marked for *âhati* and also for *mudrâ*. I could not find any explanation from R. V., which, of the two notes (*i. e.* of the anterior or posterior notes) connoted by each of these signs, have been so marked, and which would be the other note in each case. I also could not find any explanation as to what range of notes each *gharshanam* sign, in that notation, indicated. These, no doubt, were left by Sòmanâtha, the author of R. V., to the judgment gathered from practical experience, of the player.

Regarding the theory of its *ansa* notes &c., in R. V. it is said, that sa is the *ansa*, *graha*, and *nyâsa* note of Vasanta (Râga), and that it is *purna*, and that it be-shines in the morning (R. V., IV, 12 and commt.). By that *purna* is meant, having all the 7 notes of its *Mela*. N. B. **In RAGA-VIBODHA and books of that period, PURNA, as well as,** by ommitting one or two notes of a *Mela*, **SHADAVA and AUDAVA Ragas respectively, were also included within a particular MELA.**

The above R. V. *Vasanta* notation, transposed to modern notes of pitch values of either of the transpositions, as suggested above by me, and with its *sama*, *âhati* &c. signs, interpreted, as mentioned above, and with such ranges of notes of these *âhati mudrâ* &c., as were thought suitable, was played at my request, in his violin, by Babu Harimohan Banerji, teacher of European and Indian instrumental music, of (this town) Berhampore (Bengal), and in his *sitâr* by Babu Brajanath Thakur of Saidâbâd, Berhampore (Bengal). Both, (the former of whom, was my teacher of European and Indian theory of music, and of practical playing of the violin, and the latter gave me some practical lessons in *sitâr*) have unfortunately passed away. These plays of theirs, of that ancient notation (like reading passages of an unheard of dialect, written in some alphabet and script of a modern language), were, no doubt, very difficult tasks, and could only be done fragmentarily, and as very remote approaches to the original. Yet though not all the portions of that notation, still some portions of it, as played by these players, resembled modern Hindusthâni Râga *Vasanta*, as prevalent in Bengal. This resemblance, in spite of the R. V. *Vasanta Mela* and modern *Vasanta Thât* of Bengal, as shown above, being different in detail, was no doubt due to the fact, that modern Râga *Vasanta*, when properly performed by a competent artist, is done so, especially in *âlâp* form, with innumerable grades of sounds, only insignificant portions

only five frets for *vikrita* notes, within a *saptaka*, have been provided for, in that book.* In *Svaramela-kalânidhi*,† besides for the 7 *suddha* notes, theories for 7 *vikrita* notes in *srutis* independent of the *srutis* for *suddha* notes, and also for some notes in the same srutis as those of some *suddha* notes but named differently as *vikrita* notes, have been given, and Râgas have been classified into 20 *Melas*, each Mela totalling 7 notes formed of either all *suddha*, or some *suddha* and some *vikrita* notes of either one or both the varieties (of *vikritas*) mentioned above. In *Râga-Vibôdha*, besides the theory of the 7 *suddha* notes, theories of 15 *vikrita* notes have been given and some of these vikrita notes have been named with different names. Of these 15 *vikrita* notes, three have been placed in the same *srutis* as those of some *suddha* notes and two have been placed in one and the same *sruti*, and another two have been placed in another *sruti*, and the rest in independent *srutis*.‡ With these 7 *suddha* and 15 *vikrita* notes, Râgas have been classified in 23 *Melas*, one of these *Melas* being formed of 7 *suddha* notes, and the rest, of *suddha* and *vikrita* notes totalling 7 notes or

of which could be, and are, represented by the notes of its *Thât*, and the above R. V. *Vasanta* notation, by its signs attached to its notes, represent various shades of pitches of sound besides those of its notes, and through similarity in these various grades of sounds of both, no doubt, was the abovementioned resemblance.

With regard to the above difference in that *Mela* and *Thât* in spite of the above resemblance, we should bear in mind that both the above R. V. and modern *Vasanta*, had never been originally, composed written music in notation, subsequently reproduced by performers, in which case they had necessarily to be dependent upon *Melas* or *Thâts* or other particular groups of notes, but both were originally prevalent tunes, current amongst people, and heard and learnt from ear to ear, by people and artists of their periods. The *Mela* of the one and the *Thât* of the other, were alloted to them by musician theorists, mainly for facility of their playing in fretted instruments such as *vinâs* &c., and in alloting notes to that *Mela* and *Thât*, all of the abovementioned innumerable grades and shades of sounds of both, could not possibly be alloted, but only a very few of these sounds could be selected for representation, as notes, and in case of a notation (as in above R. V. notation) besides these, only a few other sounds could be vaguely shown and represented by signs for graces &c.. In the matter of selection of particular sounds as their notes, and of others as in above R. V. notation, as graces, slurs &c., was no doubt the cause of the abovementioned difference in *Mela* and *Thât*. That modern *Vasanta*, and similarly other Râgas also, would be found to slightly vary in actual practice, not only in different localities, but also amongst different musicians of the same locality, due to their having learnt from pupils of different original sources. The abovementioned different versions of the *Thât* of *Vasanta*, and similarly of other *Râgas*, as would be found exemplified in abovementioned Music of Hindostan, at Ch. V. pp. 150 *et seq.*, may be due either to a particular Râga varying in different localities, or to the adovementioned divurgence of theorists in the matter of selection of particular sounds for allotment as notes. In alloting notes to *Thâts* of, and writing the tunes in notation of, different current Râgas of his period, as done by him in G. S. S. Vol. I and II, the author of G. S. S., had done so from what he found to be common in the practical performances of these Râgas by reputed vocal and instrumental musicians of his time. Sômanâtha also, had accepted and shown in R. V., those *Melas* and forms of Râgas, that appeared to him to be the most prevalent and approved of, amongst large numbers of celebrated musicians of his time, out of the diverse forms of these Râgas in different localities (vide R. V. III, 26; IV, 5—7 &c.). From this it is apparent, that the forms and also *Melas*, of particular Râgas, differed, in that ancient period also.

* Neither has any date of *Sangita-Pârijâta* been mentioned in that book, nor could I ascertain its date from any other source. From the abovementioned application in theories of Râgas of that book, of both *Moorchhanâs* and *Melas*, however, and from the fact that *Moorchhanâs* have not been so applied in books of the 16th century A. D. and of subsequent periods, it may be assumed that the date of *Sangita-Pârijâta* was between that of S. R. and the 16th century. The abovementioned five *Vikrita* notes of this book are :—*Kômal* ri, *Tivra* ga, *Tivratara* ma, *Kômal* dha, *Tivra* ni, and these have been placed in the 6th, 10th, 15th, 19th, and 1st *srutis* respectively, and the 7 *suddha* notes sa ri ga ma pa dha ni have been placed, as in S. R. in the 4th, 7th, 9th, 13th, 17th, 20th and 22nd *srutis* respectively (vide S. P. ,verses 66-76, 494-496). I have shown in the *Parisishta* to Gita Sutra Sâr Vol. I, vi, p. 417, that the reading "*Tivratama* ma" (which is one of the abovementioned 22 *vikrita* notes) in S. P., verse 320 (provision for a fret for which note is mentioned in that text) and also in similar other texts, is incorrect, and that, that reading should be '*Tivratara* ma", and that the latter and not the former *vikrita* note has been used in the theories of Râgas in S. P..

† *Svaramelakalânidhi* by Râmâmâtya, pp. 43 plus 4, texts in Sanskrit and explanations in Mahrathi language, by the editor Bhâradvâja Sarmâ, Ganesa Press (yantrâlaya) 1910 A. D. (the place of publication, or of printing of this book is not mentioned in it). The date of *Svaramelakalânidhi*, as appears from its colophon, is Saka 1472 *i. e.* about 1550 A. D..

‡ Placing the *suddha* notes sa ri ga ma pa dha ni, as in S. R., in the 4th 7th, 9th, 13th, 17th, 20th and 22nd *srutis* respectively, the names, serial numbers, and the respective *sruti* positions of these 15 *vikrita* notes of R. V., would be, (1) *Tivra* ri (in 8th sruti), *Tivratara* ri (in 9th sruti *i. e.* in the sruti of *suddha* ga), (3) *Tivratama* ri, and (4) *Sâdhâran* ga (both in 10th sruti), (5) *Antara* ga (in 11th sruti), (6) *Mridu* ma (in 12th), (7) *Tivratama* ga (in 13th sruti *i. e.* in sruti of *suddha* ma), (8) *Tivratama* ma (in 15th sruti. N. B. in the list of notes in R. V. III, 17 commt. at p. 10, line 19 column 3, the reading '*Tivra* ma' is incorrect, and therefore very misleading. That reading should be '*Tivratama* ma'), (9) *Mridu* pa (in 16th sruti), (10) *Tivra* dha (in 21st), (11) *Tivratara* dha (in 22nd sruti *i. e.* in sruti of *suddha* ni), (12 *Tivratama* dha, and (13) *Katsik* ni (both in the 1st sruti), (14) *Kâkali* ni (in 2nd sruti), (15) *Mridu* sa (in 3rd sruti).

in some cases of additional, one or more, *vikrita* notes. In this book, for *vinâs*, besides frets for *suddha* notes, not more than 5 or 6 frets have been provided for these *vikrita* notes.*

In *Sadrâgachandrôdaya*† has been given the theory, besides of 7 *suddha*, of 7 *vikrita* notes, and of classification of Râgas into 19 *Melas*, one of these *Melas* being of 7 *suddha* notes and the rest of 7 notes formed out of the 7 *suddha* and mainly 5 *vikrita*, and in rare cases with other *vikrita* notes. The author of this book has alloted only five frets for *vikrita* notes in *vinâ*, for preventing too much proximity of frets (vide Sadrâgachandrodaya p. 12, verses 30, 31), and has advised that in cases, if any, where other *vikrita* notes were required to be prominently played, the frets should be placed suitably (*ibid.* verse 34. This probably indicated suitable shifting of frets). In *Chaturdandiprakâsikâ* and *Sangitasârâmrita* (the latter, by Tulajendra), theories, besides of 7 *suddha* notes, of five *vikrita* notes (with some other notes placed in the same *srutis* as those of some of these 7 *suddha* and 5 *vikrita* notes, and named with different names and termed *vikrita*), and of 72 theoretical, and of 19 practically principal *Melas*, have been given.‡ Similar theories of five or more *vikrita* notes, besides of 7 *suddha* notes, and of the provision of five or more frets for *vikrita* notes within a *saptaka*, besides frets for *suddha* notes, are to be found in other books of that period up to the 17th Century A. D.. In modern Hindusthâni music, as shown before, besides seven *suddha* notes, five *vikrita* notes are used in theories, and for purpose of playing these *vikrita* notes,

*In this provision for frets for *vikrita* notes, strict *sruti* positions have not been adhered to in some cases, and frets for some *vikrita* notes have been placed one sruti higher or lower, and regarding this Sômanâtha has said,—"श्रुत्यैकयाऽधिकत्वं न्यूनत्वं वा न दोषाय ॥" (R. V. II, 34). ".....एकश्रुत्याधिकत्वन्यूनत्वे अपि रंजनहानिकरे न भवत इति ससंप्रदायमाह – श्रुत्यैकयेति ॥"....." (*ibid.* commt.) *i, e.* "even though (this) excess or shortness of one *sruti* (in cases of some frets), is not to blame (*i. e*) is not detrimental to the entertaining effect. This manner of traditional (*i. e.* traditions gathered through training from teachers to pupils) doctrine, says (Sômanâtha himself) in this manner (in his text portion)" (*ibid.* and commt.). This excess or shortness of one *sruti*, in placings of some frets in *vinâ*, was similar to the difference from theoretical intervals, of the positions of the frets for notes pa and dha in modern *sitârs*, as explained before (at pp. 2 and 6 notes) by me.

† *Sadrâgachandrôdaya*, Nirnayasâgar Press, Bombay 1912 A. D. pp. 28. This book, and also *Râgamâlâ* (of same press, 1914 A. D. pp. 26) were, as spoken of before by me (at p. 82 notes), written by Pundarika Viththal (spelt before, in *ibid.* Vittal). That author says, that he, with (concise) quotations of essential elements (from ancient books) has explained his book *Râgamâlâ* (vide Râgamâ'lâ p. 1 verse 2), and *Sadrâgachandrôdaya* was written by him in conformity with actual practice of his time, due to the fact, as says the author, that, actual practice having very much departed from theory then extant, Burhan Khan (contemporary of Emperor Akbar—1561-1605 A. D.) king (of some places) near about Deccan, having commanded the author to write a book on music, conforming to actual practice, he wrote Sadrâgachandrodaya (vide *ibid.* p. 4 verses 6-10). There are similarities of classification of *vinâs* in this book and Râga Vibodha. The former also mentions some theories and doctrines that are to be found in the latter. For example, the author of Sadrâgachandrodaya (at p. 12, verses 25-28) says that he could not accept antecedent statements regarding some *svayambhuvah i. e.* self-sounding notes (in course of play of some other notes) in particular strings in *vinâ*, and that he could not (also) accept the doctrine of no practical harm (in placing some frets) of some *svaras*, (in positions of) one *sruti* more or less, and both these theories and doctrines are to be found in R. V. II, 31–35 and commts. (the latter of these doctrines of R. V. has been mentioned before by me). Thus, it is evident, that Sadrâgachandrodaya was written after 1608 A. D., the date of Râga-Vivodha.

‡The author's name, and date, of *Chaturdandiprakâsikâ* have been spoken of before by me at p. 82 notes. The *suddha* and *vikrita* notes and the numbers of theoretical and practical *Melas* of *Sangitasârâmrita*, are the same as those of *Chaturdandiprakâsikâ*, but the names of some *Melas* and the classification of Ragâs within *Melas* of the former are, in some cases different from those of the latter. From this it is apparent that both these books were of the same period, viz. 17th century A. D. I could not procure these two books, and I have collected their abovementioned theories about *vikrita* notes and *Melas* from *Srimallakshyasangitam* by Chaturâkhya Pandita (which is generally known as the pseudonym of the author, Pandit Vishnu Narain Bhatkhande) Nirnayasagar Press, Bombay, 1910 A. D. pp. 135 and Appx. pp. 19. In this (Srimal)Lakshyasangitam have been given similar theories, and quotations of texts regarding such theories, about *suddha* and *vikrita* notes, classification of Râgas including that into *Melas*, and of different *Melas*, placing of frets &c., from S. R., S. P., R. V., Svaramelakalânidhi &c., and besides these, the author has given Tables of classified Râgas, *Melas* &c. and comparative Tables of *suddha* and *vikrita* notes, relative to modern Hindusthâni *suddha* and *vikrita* notes, of most of these ancient books. The learned author has collected these with much patient labour, industry and skill. He, however, in many places, has not indicated by any signs, which are his abovementioned quotations and which are his own words, and so it is not practicable to differentiate both, except by reference to the original books. There are also some errors and fallacies in his book, a few of which I have detailed in the *Parisishta* to Vol. I of G. S. S. As an example of this fallacy, I may mention here, that (as would be apparent from theories of *sruti* differences of ancient and modern *suddha* and *vikrita* notes, spoken of before by me at pp. 80-82, 97-98 notes &c.) while ancient *suddha* sa to *suddha* ga (of S. R.) is 5 *srutis*, and modern Hindusthâni *suddha* sa to *suddha* ri is 4 *srutis*, the author of Srimallakshyasangitam, at p. 17, in his comparative Table of ancient S. R. and modern Hindusthâni *suddha* and *vikrita* notes, has shown the former sa and ga, to be the same as, the latter sa and ri.

in indigenous Indian stringed instruments, such as *vînâs, sitârs, esrâjas* &c., not more than five fixed frets or less numbers of movable frets, shifted as required, are alloted for these *vikrita* notes.

Like that are to be found in S. R. and books of more ancient periods, in books of the above subsequent ancient period up to the 17th century, and in some modern books on Hindusthâni music also, particular *graha, ansa, nyâsa,* &c. notes are assigned, in theories, to particular Râgas. In the latter ancient period, however, sa was generally alloted as the *graha* or *ansa* note of large numbers of Râgas, and some books of that period spoke of **sa being everywhere GRAHA note in RAGA***. This it may easily be inferred, was due to the practice, that came in vogue in that ancient period, of, as spoken of before (at p. 103 &c.), fixed positions of notes on sa-basis tuning, and of consequent disuse of *Madhyama-grâma,* and of the use of *Shadja-grama* only†, with larger numbers of *vikrita* notes in that *grâma.* Such fixed positions of notes on sa-basis tuning and of only one *grâma* with large numbers of *vikrita* notes is also the case in the modern Hindusthâni system. In that ancient period however, either sa or any other note, was not the Key-note of any *Mela,* and in fact, as spoken of before (at pp. 65,82 &c.) no Key-note was recognised in that period, while sa is generally the Key-note of all *Thâts* of all Râgas of the modern Hindusthâni system. Thus, assuming that in that ancient period some functions of the modern key-note was served by the *Graha* and *Ansa* notes‡, though we may think that there might have some practical utility then in some cases, in these theories of *graha, ansa* &c. notes, yet, in the abovementioned modern system, such theories of *graha, ansa, nyâsa* &c. notes of Râgas, have very little practical utility.

*"षड्जः सर्वत्र रागे च ग्रहः (*i. e.*) sa everywhere (do be) *graha* (note) in Râga" (*Râgamâlâ,* p. 2 bottom). "सर्वत्र षड्जो ग्रह एव रागे (*i. e.*) sa indeed (is) everywhere *graha* (note) in Râga" (*Sadrâgyachandrôdaya,* p. 7, verse 51).

†"किंतु विकारो देश्यां न पंचमे तद्दिह सः प्रथमः ॥" (R. V. I, 41). "...षड्जग्रामप्रचारमेव देश्यां सहेतुकमाह—किंत्विति ॥ किंतु परंतु तद्धेतोः इह देश्यां प्रथमः स ग्रामः षड्जग्रामः वर्तत इति शेषः ॥ तत्कुतः ॥ देश्यां पंचमे विकारः...न..." (*ibid.* commt.). Here Sômanâtha, says, that in *Desi* Râgas (which alone he illustrated in his book, R. V.) there being no *vikrita* form of pa, only *Shadja-grâma* existed therein (*i. e.* in the Râgas exemplified in R. V.). "...मध्यमग्रामः सोऽत्र रागे न दृश्यते ॥ षड्जग्रामान् स्थितान्रागान् सर्वे गायंति गायकाः (*i. e.*) in Râga herein (*i. e.* Râgas dealt with in this book) *Madhyama-grâma* is not seen. All singers sing *Shadja-grâma*-situated Râgas." (*Râgamala,* p. 3, lines 10-11).

‡**Key-note** and **ANSA note.** I have spoken before (at p. 21 notes) of the theory in modern European music, of the Key-note being the Governing note, which all other sounds minister. Besides these, in the modern both European and Hindusthâni systems, the **ascensions and descensions of notes are on the basis of the Key-note,** which note, as already said, is sa, for all *Thâts* of the latter system. In ancient Indian theories as spoken of in S. R. Cal, I. *ii,* 47-48, *s. c.* Poona I, *iii,* 51-52 and also as mentioned before (at p. 21 notes) by me, the *Vâdi,* also termed as, *Ansa* note, was like the King and *Samvâdi* note was like the minister, and *Anuvâdi* note was like the servant or attendant. Amongst its theoretical functions, as spoken of in the S. R. texts quoted before by translation (at p. 79 notes), the *Vâdi* or *Ansa* note was the basis for ascension to upper, and descension to lower *saptakas.* From these, and from sa being *graha* note everywhere in Râga, as mentioned in some books of the latter ancient period up to the 17th century A. D., as shown above, it may be inferred that some functions of the Key-note of abovementioned modern systems, were served by the *Graha* and *Ansa* notes of that and more ancient periods.

The abovementioned theory in abovementioned S. R. texts of the *ansa* note being the basis of ascension and descension, refers to the antique theories of the highest note-limit in *Jâtis,* in ascension, and the lowest note-limit in these in descension being established from the *ansa*-note-basis, to these limits. These theories regarding these note limits, are to be found in Dattila at p. 6, verses 57-58, and in Brhaddesi at pp. 57, 58, and in S. R. Cal. I, vi, 33-36, *s. c.* Poona I, vii, 34-37 and both commts.. A text of Bharata with slightly different readings is quoted in above Brhaddesi and S. R. Cal. and Poona commts. and other texts of Bharata on the subject, are quoted in the latter commt.. The above Dattila is so brief and concise, and there are such errors and omissions in above Brhaddesi at places, that these are very difficult to follow. The above S. R. text has, on the other hand, been interpreted differently in the two commts.. As, of these two books, S. R. Cal. is at present very rare and difficult to obtain, and as the above S. R. text and also abovementioned, quoted Bharata's text, are to be found in it, in purer form, I shall quote that text and commt. here.

मध्यमे सप्तकेऽंशः स्यात् तस्मात्तारस्थिथात् परान्। स्वरांश्चतुरस्त्वारोहेदेष तारावधिः परः। अर्वाक् तु कामचारः स्यात् तारे लुप्तोऽपि गण्यते ॥ आतारषड्जमारोहोनन्द्यवन्त्यां प्रकीर्तितः ॥ मध्यस्थानस्थितादंशादामन्द्रस्थांशमाव्रजेत्। आमन्द्र्या-समथवा तद्धस्थ-रि-धावपि ॥ यथा मन्द्रगतेः सीमा ततोऽर्वाक् कामचारिता।...(S. R, Cal, I, vi, 33-36; *s. c.* S. R. Poona I, vii, 34-37. The reading in latter is तुर आरोहे for that portion in above). मध्यमसप्तकस्थितो योऽंशस्वरः तस्मादेव तारस्थितात् चतुःस्वर-पर्यन्तमारोहणं कर्तव्यम्। अयमारोहः परोऽवधिरुक्तः। ततः परमारोहणं न कर्तव्यम्। अर्वाक् तु स्वेच्छया तारगतिः। तारे लुप्तोऽपि स्वरोग्राह्यः। भरतेन चतुर्थ पञ्चम-सप्तम-स्वरपर्यन्तं तारगतिरुक्ता। यदाह—"अंशात् तारगतिर्विधावाचतुर्थ-

In some books on modern Hindusthâni music, however, particular *graha, ansa, nyâsa,* &c. notes, have been assigned to particular modern Râgas, and in some modern books, not only *graha ansa,* &c. notes, but also particular *samvâdi* notes have been assigned to particular modern Hindusthâni Râgas in theories of these Râgas*. I have not met with such affixing of particular notes as the assigned *samvâdi* or *anuvâdi* notes of Râgas, in theories, either in S. R. or in books of more ancient or subsequent periods up to the abovementioned 17th century A. D.. Such assigning of a particular note as the affixed *samvâdi* or similarly, as the *anuvâdi* note to a Râga is quite against the spirit and theory, of such notes, of ancient periods, as spoken of by me before (at pp. 78-79 and notes). I shall further speak of these theories of these notes, hereafter.

Thus I have shown how, through greater dependence upon musical instruments, there arose larger artificiality in music, resulting in use of larger numbers of *vikrita* notes and misapplication of *graha,, ansa* &c. and *vâdi* &c. notes. In spite of that artificiality however, in modern Indian music, accomplished singers and instrumentalists, trained in the ancient Indian systems through accompaniment with, or playing with such indigenous Indian stringed instruments as *tamburâ, sâringi, vinâ, sitâr, esrâj* &c. or flute instruments as *sânâi, vânsi* &c, in spite of the abovementioned sa-basis of tuning and fixed positions of notes in these instruments, by properly tuning, and by producing slight gradations of sounds (as spoken of before at p. 96 notes) by more or less pressure of the finger on the string, or by *mir* process, or by gliding &c. in these stringed instruments, and (as spoken before at *ibid.* and p. 92 notes) by skilful blowing or by covering

स्वरादिह। आपञ्चमात् सप्तमाद्वा नातः परमिहेष्यते" इति ॥ नन्दयन्त्यां तारषड्जपर्यन्तमेवारोहणं कर्तव्यम्। पूर्वोक्त-स्यायमपवादः। मन्द्रं निरूपयति—मध्यस्थानस्थिताद्'शस्वरान्मन्द्रांशस्वरपर्यन्तमवरोहणं कर्तव्यम्। मन्द्रन्यासस्वर पर्यन्तं वा मन्द्रस्थानस्थर्षभधैवत पर्यन्तं वेति पक्षत्रयम्। एषा मन्द्रगतेः पराकाष्ठा उक्ता। अर्वाक् तु स्वेच्छया मन्द्रगतिः। (*ibid.* S. R. Cal. I, vi, 33-36 commt.).

So far as I understand, from above S. R. text and commt, after comparing the readings of, and on reference to the above Dattila &c. and also their contexts, the abovementioned highest and lowest limits of notes in *Jâtis*, as spoken of in abovequoted texts and commts. are as follows :—The abovementioned highest note-limit in ascension, according to Bharata, could be, from *ansa* note upwards up to the fourth or (in some cases or in some *Jâtis*), to the fifth or to the seventh note, and according to Sârangadeva, as interpreted in above commt., that limit could be, from the *ansa* note, situated in middle-*saptaka*, up to next higher *târa* (*i. e.* upper)-saptaka-situated four notes, and for counting these four notes, the omitted note, if any, should also be counted, and in the special case of *Nandayanti-Jâti* (whose *grâma* was *Madhyama grâma*, and *ansa* note was pa), that highest note limit could be up to *târa*-sa. The abovementioned limits of notes in descension, as spoken of by Sârangadava, and as interpreted in above commt., could be from the *ansa* note situated in middle-*saptaka* up to *mandra-ansa* note (*i. e.* up to that *ansa* note situated in *mandra i. e.* lower *saptaka*), or (in some cases or in some *Jâtis*) up to *mandra-nyâsa* note (*i. e.* the *nyâsa* note in lower-*saptaka*) or also (in some cases or in some *Jâtis*) lower, up to *mandra*-ri or *mandra*-dha. Kallinâtha, in abovementioned S. R Poona I, vii, 34-37 commt. has interpreted the above highest limit, spoken of in above S. R. text, as, up to the four notes *târa*-ri to *târa*-pa in all *Jâtis* of *Shadja-grâma*, and to the four notes *târa*-ma to *târa*-ni, in all *Jâtis* of *Madhyama-grâma*. That commentator in that commt., has interpreted the above lowest limit *mandra-ansa* note of above S. R. text, as up to *mandra*-sa in *Jâtis* of *Shadja-grâma*, and to *mandra*-ma in *Jâtis* of *Madhyama-grâma*, and he has interpreted the above *mandra-nyâsa* limit of above text, as up to the ending note of both *grâmas*, situated in *mandra*-saptaka, and these in reverse order for these *grâmas*, *i. e.* up to *mandra*-ga in *Jâtis* of *Shadja-grâma* and up to *mandra*-ni in *Jâtis* of *Madhyama-grâma*.

The above theoretical note limits were with regard to *Jâtis*, and from these it would be seen how the *ansa* note is misapplied in theory, in modern Hindusthâni music, in which, as already said, sa is generally the Key-note of all *Thâts* of all Râgas.

N. B These **JATIs**, as spoken of before, were antique classifications of *gitas* and also of Râgas (in which latter were also included *gitas*) into different *Jâtis*. From the theories of these different antique *Jâtis*. (as are to be found in Brhaddesi at pp, 53-81 and S. R. Cal. I, vi, *s.c.* Poona I, vii and commts.) it would be seen that one or more notes were assigned to particular *Jâtis* as their *ansa* notes, and besides these, particular notes being *nyâsa* notes, being *sampurna*, or by omission of particular notes, being *Shâdava* or *Audava*, the *ansa* note being in some cases of *târa saptaka*, having *Bahula* or *Alpa* application of particular notes &c., were theoretical elements of particular *Jâtis*. The above—more than one note being the assigned *ansa* notes of particular *Jâtis*,—signified that, within such a *Jâti* were included *gitas* or *Râgas*, having one or other of these notes as their *ansa* notes.

* *e. g.* pa, as the *samvâdi* note of modern Hindusthâni *Suddhakalyâna* Râga in *(Srimal)Lakshyasangitam* at p. 61, verse 22, and in *Râgakalpadrumânkurah* (by Kâsinâtha, pp. 11, Nirnayasâgar Press, Bombay, 1911 A. D.) ga as *samvâdi* note of modern Hindusthâni Râga *Asâvari*, at p. 3, verse 15.

the holes more or less in these flute instruments, could and can produce notes and other sounds, and also fine gradations of these, in pure and elegant forms, suitable to each Râga, or other indigenous Indian music and in this manner could and can play these Râgas and other music properly. Trained in the above old indigenous method, accomplished Indian musicians did and still do attain very fine musical ears with ability to distinguish, as well as perform, fine gradations of sounds. To them, the performing of the seven *suddha* notes sa ri ga &c. in their pure forms and to distinguish the 3 or 4 *srutis i. e.* minor and major intervals, between these notes, were and are not considered as any great, but only an ordinary achievement.

All this alas, has changed in modern times. Indian music, and even the preliminary training of the seven *suddha* notes sa ri ga ma &c. are nowadays generally taught with, and learnt by beginners including children, with the aid of the harmonium, generally of the type mentioned before by me (at pp, 30-32), and as a general rule Indian music, both vocal and instrumental, is now performed with accompaniment of that instrument. Due to the baneful and injurious effect therefrom, as spoken of before (in *ibid.*) and due also to the fact that besides the notes played by its keys, no gradations of sounds between these notes are possible in that instrument, modern Indian musicians as a general rule, excepting the few who still follow the abovementioned old indigenous method, do not attain the fine musical ear spoken of above. Besides that, due to the wilful or conscious, or as spoken of before (at pp. 31-32) inevitable unconscious imitation of the notes of that instrument, which notes (as spoken of at pp. 30-32) are artificial and tempered at their best, and generally harsh and out of tune, these modern Indian musicians (excepting the few, the training of whose ears has been well established by the abovementioned old method) while **performing Ragas** and other Indian music, including provincial and folk-song music, such as *Bhajan, Gazal, Kirtan, Vâul* &c., as a general rule do so, even **in such instruments as the violin**, *sitâr, esraj* &c, in which free play of notes and fine gradations of sounds are possible, **and also in** their **voices, by producing the variously false notes as** are to be **found**, as spoken of before (in *ibid.*) **in various harmoniums.** These Râgas and other music are injured and often destroyed thereby. Not to speak of this, most of these modern Indian musicians, excepting the few practised in the old system, mentioned above, can neither produce purely, even the seven *suddha* notes sa ri ga &c., nor can they distinguish by their ears the difference between 3 and 4 *srutis i. e.* minor and major intervals, that lie within these notes.

In addition to the evil effect spoken of above, through that general use of the harmonium, as, in producing notes in that instrument, requiring belowing and stopping of its keys, some time necessarily elapses in playing one note after another, for that reason, such fine play of rhythm and variations of rhythm, with which accomplished Indian singers, instrument players and also drummers, trained in the indigenous old Indian method, generally perform their music, are not possible in the harmonium, and thus the abovementioned practice and accompaniment with the **harmonium**, have a **dragging** and injurious **effect on** such fine **play of rhythm.**

Thus it will be seen that the greater and greater artificiality in music through more and more dependence upon musical instruments, has, with the dependence upon the instrument of foreign origin, the harmonium, culminated in having a deadening and destructive effect on Indian music. Similar injury has been done in Europe, due to the general use of the pianoforte, but as the notes of that instrument are generally sweet, and not as out of tune, as spoken of before (at p. 31), as those of the harmonium, that injury has been less in Europe. †

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†As would be found from the words of Mr. Clements quoted below, the capacity to detect the difference of one *sruti i. e.* the divurgence between 3 and 4 *srutis i. e.* minor and major intervals, is now considered as extraordinary ability in Europe. That was not so there, and pupils used easily to learn and perform properly the notes of the pure natural scale and to distinguish the above divurgence of intervals, about 60 or 70 years ago, in England, when pure notes, and pure intervals between notes, of the natural scale, and music on the basis of such and similar notes and intervals, were taught to pupils, in Mr. Curwen's Tonic-sol-fa system (vide *Grammar* by John Curwen, edn. 1852, revised edn., *Grammar of Vocal Music* by do., 1866. These books are long out of print). After the death of Mr. Curwen, his students and followers adapted that Tonic-sol-fa method to the general practice in Europe of teaching, playing and accompanying music with, and with the help of, and on the basis of, the pianoforte. That, and the grave injury caused therby, due to the notes of equal temperament of the piano, has been referred to by Mr. Clements in the following :—

Without properly appreciating what the author (of Gita Sutra Sar) said about the harmonium, many used to think and say, and some still say that he recommended the use of the harmonium for Indian Music. What the author really advised was the imitation in the voice, of such sweet sounds as those of the harmonium, *esrâj*, violin &c. (vide Gita Sutra Sar, Vol. I., 3rd edition p. 4) but he positively said, that, due to their artificial notes and to the impossibility of playing *Mir* (*i.e.* graces with gradations of sounds) by their keys, Indian Music, except westernised compositions made in imitation of the Western system, could not, in the harmonium &c. (*i. e.* piano, organ &c.), be properly played (*vide*, *ibid.* p. 4, publisher's notes, and also p. 25) and that as the *rasa* (*i. e.* feeling, emotion and expression) of Hindu Music would be altogether destroyed by harmonium, piano &c. it would be immensely unwise to play Hindusthâni Music in these instruments (vide *ibid.* p. 143). The author's above recommendation for imitating in the voice, the sweet sounds like those of the harmonium, held good during the author's time, when, harmoniums, being imports from Europe, and generally of good make, were mostly sweet sounding. That advice is

"The musician of Europe is in the habit of proclaiming that the ordinary singer or performer has not sufficiently sensitive ears to detect a difference of one *sruti*. The same parrot cry was raised in ancient Greece. Everyone acquainted with the science of intonation knows however that it has no foundation in fact. School children in England were taught to sing dead in tune and therefore to distinguish between three *srutis* and four *srutis* when the tonic solfa system was in its early uncorrupted state. Then came the days of the cheap tempered piano when every elementary school was provided with that baneful instrument. The tonic solfa is now merely an adjunct of equal temperament.

"Music however has not yet been killed outright. In Europe it is under the influence and guidance of leaders who are enthralled and corrupted by temperament. The amateur has very little chance of becoming acquainted either practically or theoretically with real music. But the musical genius, cellist, violinist, or operatic singer, who attains to world-wide fame, succeeds in spite of the defects of his training. His sense of harmony is too strong to be fettered, but owing to a faulty education, it is an untutored feeling which he cannot expre . in words.

"This point of contact, where East and West agree, although for different reasons, is one of the most extraordinary features of the world's music of the present day. The western musician's education has almost killed his intuitive knowledge of intonation, while the Indian *gawaiyya* cannot communicate his more profound acquaintance with the same subject for the lack of education and scientific training." (*Lectures on Indian Music*, delivered in Bombay University, in 1926, by Mr. E. Clements, I. C. S., published by the Registrar, Bombay University, 1927, at Preface p. ii). Even able Indian instrument players and also *gâwâiyâs i. e.* singers, though they can perform and detect abovementioned and similar fine differences of pitches and of intervals, yet, for want of education and training in pitch-values &c., *e. g.* in the manner in which values of pitches and of intervals have been given in Gita Sutra Sâr Vol. I, and in its *Parisishta*, can not properly explain such difference of pitches and of intervals &c. to others. That is what is spoken of in above, by Mr. Clements. In these Lectures Mr. Clements had also strongly condemned the harmonium, and I quote below some of his words on that subject :—

"...the harmonium of Europe with its artificial intonation has captured the stage, the school and the home. Even in musical academies which pride themselves on their knowledge of the *râgas*, the harmonium is used to teach 'the scale' to beginners. The corruption of public taste therefore begins even in infancy. No wonder that the public in general are not deeply interested in scientific musical training.

"The harmonium which flood the Indian market for musical instruments are tuned with more or less accuracy to start with in a system of tuning known as equal temperament. After their arrival in India they are either never tuned again, or are tinkered at by someone utterly unacquainted with the difficult problems involved. As the brass vibrators used in the harmonium are easily affected by climatic changes, the instrument, to be kept in the same tuning, would require adjustment at least once a fortnight. The stage managers of Indian theatres are blissfully unconscious of this. Even were it otherwise, they know of no remedy. Recall to your minds the infinite pains taken by the professional musician to get his tambura exactly in tune, and contrast that with the lethargy of the "peti player."" (*ibid.* Bombay University Lectures, I, pp. 5-6).

In these Lectures Mr. Clements, has given ratios of intervals and also pitch values of notes of the Scales (*i. e. Thâts*) of some Râgas. These ratios as given by him, are simple harmonic ratios. (vide *ibid.* Lecture 6). In the Appendix to his Preface to these Lectures, he has also recommended particular tunings of the harmonium, to suit some Râgas. From my own experience, and from some tests taken by me, with a sonometer, of the pitch values of some notes of some Râgas, as played in the *sitâr* (some results of which tests I have detailed in the *Parisishta* to Vol. I, of this book G. S. S.), I am of opinion that there are so many gradations and shades of pitch values of the same named *vikrita* notes and even of some *suddha* notes included within *Thâts* of different Râgas, that, to represent these pitch values, by ratios of intervals between notes of these *Thâts*, or of other theoretically propounded Scales or Modes, would result in various complicated ratios in cases of some notes of some Râgas, and that it would not be possible to confine these ratios within the simple harmonic ratios, as has been given by Mr. Clements for the notes of his abovementioned Scales, and also of the Modes suggested therein by him, for some Râgas. I think that the pitches of notes of some Râgas have been forced to fit in these simple harmonic ratios of Mr. Clements. I am also of opinion, that the different tunings of the harmonium mentioned by Mr. Clements, would not be suitable for playing even the few Râgas for which he has advised these tunings, as, by fixing any values, of the pitches, of the 12 or such numbers of

inapplicable now with the harsh-sounding harmoniums, generally in use (as spoken of before at pp. 30-32) nowadays.

I shall now speak, as promised before, of **Vadi, Samvadi, Anuvadi** and **Vivadi,** and also of **Apanyasa, Samnyasa** and **Vinyasa.** Of these notes I spoke before, (former spelt also as Badi, Sambadi &c. at pp. 21 and notes, 35, 79 notes, 80 notes, 88, &c.), as gathered from S. R. and its two commts., and R. V. &c. I shall here speak of their theories including theories of application, in the light of what I could understand of the same with the help of Dattila and Brhaddesi, which I could procure afterwards,* after correcting the errors and omissions, mentioned before (at p. 86 notes) of the latter as well as the former books, by the process mentioned before (at *ibid.*). On reference to that Brhaddesi, I could find, as already said (at p. 86 notes) that the correct reading of the passage of S. R. Poona I, iii, 51-52 commt., mentioned before by me (at pp. 78-79 notes) would be exactly what I had suggested, there. There are similar errors in Brhaddesi and S. R. Cal. commt. also, and these and other errors and omissions, in the abovementioned books, especially in Brhaddesi, are various and very misleading at places, and as some of these Brhaddesi texts are quoted with purer readings in above S. R. Cal. (Sinhabhupâla's) commt., and as the above subjects have been in the past misunderstood, and are still being misunderstood, and, as spoken before, being misapplied, by not only European, but also Indian writers and theorists on both ancient and modern Indian music, I shall here explain the above subject, with some quotations from original texts and commts., especially from abovementioned S. R. Cal. and commt., which book, as already said, has become very rare and difficult to procure nowadays.

Of the above Vâdi, Samvâdi &c., **VADI** also termed **ANSA,** has been **defined, and its theoretical functions,** have been spoken of by Sârangadeva, and that text has been explained by Sinhabhupâla, as follows :—

यो रक्तिव्यञ्जको गेये यत्संवाद्यनुवादिनौ ॥ विदार्यां बहुलौ यस्मात्तारमन्द्रव्यवस्थितिः ॥ ३१ ॥ यः स्वयं यस्य संवादी (वा-) नुवादी स्वरोऽपरः ॥ न्यासापन्यासविन्याससंन्या(स)ग्रहतां गतः ॥ प्रयोगे बहलः स स्याद्वाद्यंशो योग्यतावशात् ॥३२॥ बहलत्वं प्रयोगेषु व्यापकं त्वंशलक्षणम्† ॥३३॥ (S. R. Poona I, vii, 31-33, s. c. S. R. Cal. I, vi 30-32) यो गीते रञ्जकत्वं व्यनक्ति यस्य सम्वादी अनुवादी च विदार्य्यां बहुलः। (ननु विदारीशब्देन किमुच्यते ? गीतखण्डः। सा विदारी द्विविधा—गीतविदारी पद-विदारीचेति। सा विशेषेण तालाध्याये निरूपयिष्यते) ।‡ यमवधिं कृत्वा मन्द्रतारव्यवस्था, यो वा यस्य सम्वादी अनुवादी वा न्यासत्वमपन्यासत्वं विन्यासत्वं संन्यासत्वं वा ग्रहत्वञ्च प्राप्नोति, यस्य जात्यादिप्रयोगे बाहुल्यं, स वादी अंशश्च इत्युच्यते। योग्यतावशात् प्राधान्यात् वादीशब्दवाच्यत्वम्। अन्यैर्लक्षणैरंशशब्दवाच्यत्वमिति। प्रयोगबाहुल्यमेव मुख्यं लक्षणमंशस्येत्याह—बहुलत्वं प्रयोगेषु व्यापकं त्वंशलक्षणम् ॥ ननु कथमस्यांशशब्दवाच्यत्वमंशशब्देन भाग इत्युच्यते ? अयमपि जातिरागादिविभागकारित्वादंशशब्देनोच्यते कारणे कार्य्यवदुपचारः। (*ibid.* S. R. Cal. I, vi, 30-32 commt).

I have given before (at p. 79 notes) English translations of above S. R. texts, by adopting mainly the abovequoted interpretations of Sinhabhupâla and partly the interpretations (not quoted above), of Kallinâtha. The above texts as interpreted by above quoted Sinhabhupâla's commt., speak of the following **theoretical functions of VADI,**—"(1) Which (note) expresses the agreeability in *gita.* (2) Whose *samvâdi* also *anuvâdi* (be) *bahula* in *vidâri.* [Question. What is spoken of by (the) word *vidâri*? (Answar) *gita*-division. That *vidâri* (does be) of two sorts, *gita-vidâri, pada-vidâri* also, thus (be of two sorts). That would be

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notes within an octave, played by its keys it would not be possible to play in that instrument, sounds of gradations and shades of pitches between these notes, without which the forms of Indian Râgas cannot be properly played or shown. Besides that, the harmonium, in whatever manner it may be tuned, would, as spoken in above, by Mr. Clements, loose that tuning within a fortnight and it would be a formidable task to retune it to its initial tuning. For this reason also, the harmonium, even if tuned, as recommended by Mr. Clements, would not be suitable for playing Indian Ragas, including those for which he has recommended these tunings.

* I could procure *Brhaddesi,* as already said at p. 85 notes, after the printing of the pages up to p. 84. Similarly, after printing up to that page, I could procure *Dattila, Sangitasamayasâra* and a few other ancient Sanskrit books on Indian music.

† The portions within brackets, are from S. R. Cal.. For above ङ्गा the reading, in S. R. Poona Commt. is ङ्ग, and above स्व is omitted in S. R. Poona text.

‡ This portion, given within brackets in above commt., is no doubt a quotation from the texts of Matanga that are to be found with some errors and omissions of readings and also with some additional passages, in Brhaddesi p. 57, lines 14-17 and p. 60.

explicitly found out in chapter on *Tâla*].* (3) Starting from which (does be the) rule regarding (limits of ascension and descension to) *târa* and *mandra* (notes).† (4) Which, or whose *samvâdi* or *anuvâdi*, does attain *nyâsa*-ness *apanyâsa*-ness *vinyâsa*-ness *samnyâsa*-ness *graha*-ness also. (5) Of which (would be) *bahula*-ness in application in *Jâtis* &c., he, is spoken (of as) *vâdi*, *ansa* also, thus, (is spoken). *Yogyatâ-vasât* (*i. e.* from mastering of fitness) *i. e.* from superiority (does be) terminology (or nomenclature) by the word *vadi*, by other indicative signs (be) the terminology (or nomenclature) by (the) word *ansa*, (the above be),in this manner.‡ *Bahula*-ness (in) application indeed (does be the) chief indicative sign of *ansa*, thus says (Sârangadeva)—'*bahula*-ness in applications, otherwise (being) pervador (or permeator, would be) indicative sign of **ansa**'. (Thereafter, in above commt. Sinhabhupâla adds, that the literal meaning of *ansa* being division, and from the *ansa* note also having the function of being divider (*i.e.* classifier) of *Jâti*, Râga &c. (of *gitas*), the word *ansa* here bears a derivative meaning)" (*ibid.* S. R. Cal. I, vi, 30-32 Commt.)

Of the terms *nyâsa*, *apanyâsa* &c. spoken of in above texts, I have explained before, *nyâsa* and *graha*, and at p. 79 notes, have explained **bahula.** I shall next, at first explain *apanyâsa*, *samnyâsa*, and *vinyâsa*, and thereafter speak of the terms *samvâdi* &c., mentioned in these texts. Regarding these *apanyâsa* &c. Sârangadeva says,—

अपन्यासः स्वरः स स्याद्यो विदारी समापकः ॥ (S. R. Poona, I vii, 41; *s.c.* S. R. Cal. I, vi, 38). यः स्वरः विदार्य्याः गीतावयवस्य समापकः सः अपन्यासः। मतङ्गेनाप्युक्तं—"यत्र समाप्तमिव गीतं ध्वनौ भासते सोऽपन्यासः। स च विदारीमध्ये भवति। गीतशरीरमध्य इत्यर्थः" इति§ ॥ (*ibid.* S. R. Cal. I, vi, 38 commt.). अंशाविवादी गीतस्याऽऽद्यविदारी-समाप्तिकृत्। संन्यासोऽंशाविवाद्येव विन्यासः स तु कथ्यते ॥ यो विदारीभागरूपपदप्रान्तेऽवतिष्ठते ॥ (S. R. Poona I, vi, 47-48, *s.c.* S. R. Cal. I. vi, 45-46). यः स्वरः अंशेन सह अविवादी सन् विदार्य्यै(र्य्यां ?) समापयति सः संन्यासः। मतङ्गेनाप्युक्तम्—"अंशस्य विवादी यो न भवति प्रथमविदार्य्यन्ते यदि प्रयुक्तो भवति तदा संन्यास" इति (1) ॥ विन्यासं लक्षयति—अंशेन सह अविवाद्येव यः स्वरः विदार्यं(र्य)शरूपाणां पा(प?)दानां प्रान्ते तिष्ठति स विन्यासः स्वरः। मतङ्गेनापि "एष एव स्वरः संन्यासस्वरः यदा अन्ते विन्यासः स्यात् तदा विन्यासः। अंशस्य सम्वाद्यनुवादी भवति पदविदार्यन्ते भवति" इत्युक्तम् (2) ॥ (*ibid.* S.R. Cal. I, vi. 45-46 commt.).

From above, and from *nyâsa* as explained before, we find that of a *gita*, **Nyasa**-note was its ending note. A *gita* could however be either one complete unit (*e. g. âlâpa* of *Prabandha*, vide S. R. Poona, II, 24-25 and commt.) or be divided into sections, which were termed *vidâris* (*e. g. rupaka* of *Prabandha*, vide *ibid.*). In the latter case, the ending note of the last section, which would also be the ending note of the *gita*, would be its *nyâsa* note, and the ending note of a *vidâri i. e*, of a section, excepting the above last section (*i. e.* of an intermediate section), would be **Apanyasa**-note of that *gita*. Of this, says Matanga, in the text of his, quoted in above S. R. Commt.,—"where (a) *gita* in sound, shines as if ended that (would be the place of) *Apanyâsa*, and that does be in *vidâri*-interior, (*i. e.*) in interior of (the) body of (the *gita*), such is the meaning." *Samnyâsa* is spoken of in above as,—"that note, which being non-*vivâdi* of the *ansa* note (*i. e.*

* This portion, within larger brackets, here is, as already said, quoted from Matanga. The above *gita-vidâri* signified a section of a *gita*, especially one or other of the intermediate sections (*i. e.* others, excepting the last section) of a *gita*. The above *pada-vidâri* signified a subdivisional part termed *pada*, of a *gita*, or of a *vidâri* of a *gita* (vide Brhaddesi, pp. 57 and 60, and also S. R. Poona II, 25 ; III, 195-196 and commts.).

† This refers to the ancient theory, of the notes counted from the *ansa* note, up to which would be highest and lowest limits of ascension and descension in *Jâtis*, spoken of before by me, at pp. 113-114 notes &c. .

‡ Kallinâtha has interpreted the above S. R. texts about above elements (4) and (5) and the next following text about *vâdi* being termed *ansa*, as,—"Which (note) itself does (occasionally) be its own *samvâdi*. Whose (*i. e. vâdi's*) *anuvâdi* however, other note indeed does be. Not any time assuredly, (it) itself (does be) its own *anuvâdi*, such is the meaning. As, in human affairs, (the) king from necessity, in some places, does be (the) actor of ministerial duties, yet not any time does be (the) actor of servant's duties, like that. Which (note) having attained *nyâsa*, *apanyâsa*, *vinyâsa*, *samnyâsa*, *graha* functions, would be *bahula* in application. He [*i. e.* that note, having the abovementioned elements (1) to (5)], *vâdi*, from mastering of fitness would be (termed) *ansa*." (*ibid.* S. R. Poona I, vii. 31-32 commt.). I have adopted the above interpretation, of the above last sentence, in my translations of above S. R. texts, given before by me at p. 79 notes.

§ This Matanga's text, with errors and also some slight divurgences in readings is to be found in Brhaddesi at p. 57, lines, 13-14 and p. 60, lines 14-17.

(1) and (2), these Matanga's texts, with some errors and divuergences in readings, are to be found in Brhaddesi at p. 57 bottom.

either the note, same as the *ansa* note, or a note having some other *samvâdi* relation with, or being *anuvâdi* of the *ansa*-note), if be the ending note of the first *vidâri* of a *gita*, then that note would be the **Samnyasa** note of that *gita*." *Vinyâsa* is next spoken of in above as,—"such non-*vivâdi* note* indeed, when that be the ending note of (a) *pada*-subdivision of a *vidari* of a *gita*, then that note would be *Vinyâsa* note (of that *gita*)." The above *pada*, has been spoken of before. That pada was a subdivisional part of a *gita* or of its *vidâri*. The places of a *gita*, where these *nyâsa*, *apanyâsa*, *samnyâsa* and *vinyâsa* notes ended were also termed *nyâsa*, *apanyâsa*, *samnyâsa* and *vinyâsa* (places) respectively, of that *gita*. I shall now speak of *Samvâdi* &c..

Ancient books speak of the **four sort of notes,—vadi, samvadi, anuvadi** and **vivadi,** and of these Dattila has spoken very briefly as follows,—योऽत्यन्तबहुलो यत्र वादी वांशश्च तत्र सः । मि(थः संवादि)नौ† ज्ञेयौ त्रयोदशनवान्तरौ ॥ अतोऽनुवादिनः शेषा द्वन्तरौ तु विवादिनौ। स्वरांश्रुतिर्विधानेव जानीयात् स्वरयोगवित् ॥ (Dattila p. 2, verses 18-19). *i. e.* "where what note (is) very much *bahula*, there that (note would be) *vâdi* (or) *ansa* also. (The) two (notes), thirteen (and also) nine *srutis* apart should be known as mutually *samvâdis* (with each other). Hence, the rest (should be known as) *anuvâdis*, but (the) two (notes) two *srutis* apart (would be) *vivâdis*, (These) four sorts of notes, as a matter of course, (one) versed in assemblage of notes, should know." (*ibid.*). Matanga, besides speaking of similar *sruti* differences of these, has "spoken of *samvâdi* as,—संवादिनस्तु पुनः समश्रुतिकत्वे सति त्रयोदश नवान्तरत्वेनावबोद्धव्याः ।‡ (Brhaddesi p. 14). *i. e. samvâdis* however, should be understood, in, being similar *struti*-ed (and) by thirteen (also) nine *srutis* apartness" (*ibid*). The above similar *sruti*-ed evidently signified notes of the same pitch or one or more octaves apart. Besides so speaking, Matanga has also elaborated the theories of those four sorts of notes in Brhaddesi pp. 13-17. Sârangadeva has spoken as above, of *samvâdi* and *anuvâdi* but he has spoken differently, as shown below, regarding *vivâdi*, and, besides that, he has spoken of *vâdi*, *samvâdi*, &c. as king, minister &c. in S. R. Cal. I, ii, 45-48, *s. c.* Poona I, iii, 49-52. In *ibid.* commts., both his commentators, while explaining these S. R. texts, have freely quoted from above Dattila and Matanga. Somanâtha, following above Dattila, Matanga, and also Sârangadeva, and also by freely quoting from them, especially from Matanga, has explained the ancient theories of these *vâdi*, *samvâdi* &c. in R. V. I, 36-38 and commts..

From above, and from examples of *samvâdi* &c. given in above, we find that, regarding these four sorts of notes *vâdi*, *samvâdi* &c., Dattila, Sârangadeva and Somanâtha have spoken of *vâdi* being *bahula* in application. Matanga has spoken of two notes *sama-sruti*-ed, being samvâdi, and he and Dattila have spoken that two notes thirteen and also nine *srutis* apart, *e. g.* sa and pa of Shadja-*grâma* ; sa and ma ; ri and dha ; ga and ni ; ma and ni of both Shdj. and Mdm. gms., would be mutually *samvâdi* with each other. Sârangadeva has spoken of the same 13 or 9 *srutis* differences as *samvâdi*, but has described these differences as,—"between whom be 12 or 8 *srutis*." Dattila, Matanga and Somanâtha have spoken of *vivâdis*, as,—both of the two notes, which were two *srutis* apart (or, as described also otherwise by Matanga,—between which be one *sruti*) *e. g.* ri and ga ; dha and ni of both Gms., would be mutually *vivâdis* with each other. Sârangadeva has spoken of *vivâdis*, somewhat differently as shown below.§ Somanâtha, as mentioned above, and Pundarika Viththal in Râgamâla p. 2 lines 13-19, and also in Sadrâgachandrodaya

* While speaking about *vinyâsa* in his abovequoted texts, Matanga has said that *vinyâsa* note does be *samvâdi* (or) *anuvâdi* of *ansa* (note). That *Samvâdi*, as would appear from Matanga's texts on the subject quoted by me hereafter, included the two notes *sama-sruti*-ed (*i. e.*) of the same pitch or one or more octaves apart, and also the two notes, either 13 or 9 *srutis* apart. Thus the above 'non-*vivâdi*' spoken of in. above S. R. texts, in connection with both *samnyâsa* and *vinyâsa*, signified a note same as, or having other *samvâdi* relation with, the *ansa* note, or a note having *anuvâdi* relation with the *ansa* note. In this connection vide,—"Which itself, (or) whose *samvâdi* or *anuvâdi*, other note, is attained (with) *nyâsa*-ness, *apanyâsa*-ness, *vinyâsa*-ness, *samnyâsa*-ness, *graha*-ness," as spoken of by Sârangadeva in S. R. Poona I, vii, 32, *s. c.* S. R. Cal. I, vi, 31, quoted and explained before (at pp. 117-118) by me.

† The portion within brackets here, is from that half verse, as quoted in S. R. Cal. I, ii, 46 commt.. In above Dattila, there are errors and omissions in this portion.

‡ रत्वे चान्योन्यं बोद्धव्यम् as quoted in S. R. Cal I, ii, 46 Commt.; तरितत्वेनान्योन्यं बोद्धव्याः as quoted in R. V. I, 37 Commt..

§ Sârangadeva, no doubt collecting, as spoken of before by me (at p.84 notes) from more ancient authors, has given the following three ancient different versions of *vivâdi* in S. R. Cal. I. ii, 46-47 *s. c.* Poona I, iii, 50-51,—(1) the two ni and ga would be *vivâdis*

p. 6 verses 34-36, have spoken of *vivâdi*, as done by Dattila and Matanga as mentioned above, and of *vâdi* and of *sruti* differences of *samvâdi* as above, and all these authors have said, as done by Dattila and Matanga, that the two notes which were neither *samvâdi* nor *vivâdi* would be mutually *anuvâdis* with each other. Thus, according to Dattila, Matanga, and these authors, notes 3, 4, 5, 6, 7, 8, 10, 11, 12, 16 &c. *srutis* apart, *e. g.*, sa and ri ; pa and dha ; pa and ni ; sa and dha would be mutually *anuvâdis* of each other.

With similar *sruti* differences would be *samvâdi*, *anuvâdi* and *vivâdi* relations amongst *vikrita* notes also. Vide,—**तथा विकृतावस्थायां गमयोर्नि(स)योश्च विवादो द्रष्टव्यः।** (S. R. Poona I, iii, 52 Commt.. For the reading **स** within brackets, which is suggested by me here, the reading in that Commt. in that book, is **ध**. The latter reading is obviously incorrect) *i. e.* "likewise, in *vikrita* state, *vivâdi*-relation of ga (*i. e. antara*-ga) and ma ; and of ni (*i. e, kâkali*-ni) and (its upper) sa also, should be seen." (*ibid.* Commt.). Vide also **एवं विकृतेष्वप्यूह्यम्** *i. e*, so, in *vikritas* also, (should be) understood. (R. V. I, 38 Commt. at end).

I have mentioned before (at p. 21 notes) the ancient theory of *vâdi*, *samvâdi* &c. being like king, minister &c.. Regarding these theories Matanga says,—**वदनाद् वादी स्वामिवत्। संवदनात् संवादी अमात्यवत्। अनुवदनादनुवादी परिजनवत्। विवदनाद् विवादी शत्रुवत्। ...वदनं हि नामात्र प्रतिपादकत्वं विवक्षितं, न वचनमिति। किं तत् प्रतिपादयति। रागस्य रागत्वं जनयति।...(p. 13)...किं तत् संवादित्वं नाम। यद् वादिस्वरेण रागस्य रागत्वं जनितं तन्निर्वाहकत्वं नाम संवादित्वम्...संवादिप्रयोगो यथा—यस्मिन् गीते यौऽशत्वेन परिकल्पितः षड्जस्तस्य स्थाने मध्यमः क्रियमाणो रागहा न भवेत्। यस्मिन् स्थाने मूर्छनावशान्मध्यमः प्रयुक्तः अस्मिन् स्थाने क्रियमाणः षड्जो जातिरागहा न भवेत्। षड्जपञ्चमयोः स्थाने पञ्चमषड्जौ प्रयुज्यमानौ जातिरागहानिकरौ न भवतः। एवम् ऋषभधैवतयोः स्थाने धैवतर्षभौ प्रयुज्यमानौ जातिरागविनाशकरौ न भवतः। एवं गान्धारनिषादयोः स्थाने निषादगान्धारौ। ककुभस्य धैवतांशत्वेन रेवगुप्तस्य ऋषभांशत्वेन तदुभयरागज्ञाश्च(।?)र्षभीजातेर्ऋषभांशपरिग्रहात् परस्परसम्बद्धौ च प्रयुज्यमानौ जातिरागविनाशकरौ न भवतः।...(p. 14)...।...ननु किं तदनुवादित्वम्। यत् संवादिना (1) रागस्य रागत्वं संपादितं (2) तत्प्रतिपा(दकत्वं) (3) नामानुवादित्वम्।.....अनुवादिप्रयोगो यथा—षड्जस्थाने ऋषभः ऋषभस्थाने षड्जः प्रयुज्यमानः स्वरूपं भजन् जातिरागहा न भवति। पञ्चमस्य स्थाने धैवतः प्रयुज्यमानो धैवतस्य स्थाने पञ्चमः प्रयुज्यमानो रागहा न भवेत्। षड्जस्थाने धैवतः प्रयुज्यमानो धैवतस्थाने षड्जः प्रयुज्यमानो जातिरागविनाशकरो न भवति। पञ्चमस्थाने ऋषभः प्रयुज्यमानः ऋषभस्थाने पञ्चमः प्रयुज्यमानो जातिरागहा न भवेत्।...किं तद् विवादित्वं नाम। वाद्यादिभिः स्वरैर्यद् रागस्य वादित्वं संवादित्वमनुवादित्वं प्राप्तं, तद्विनाशकत्वं नाम विवादित्वम्।... (p. 15) ... विवादिप्रयोगो यथा—ऋषभस्थाने गान्धारः प्रयुज्यमानो गान्धारस्थाने (4) ऋषभः प्रयुज्यमानो जातिरागहानिकरो भवेत्। धैवतस्थाने निषादः प्रयुज्यमानो जातिरागहानिकरो भवेत्। इति षड्जग्रामे।... (p. 16)... (Brhaddesi pp. 13-16).**

i. e. "from *vadanam* (literally meaning, act of speaking) *vâdi* (is) like (the) master (or gevernor). From *samvadanam* (lit., speaking alike, or becoming-speaking) *samvâdi* (would be) like (a) minister. From *anuvadanam* (lit., similar speaking) *anuvâdi* (would be) like (an) attendant (or servant, or valet). From *vivadanam* (lit., anti-speaking) *vivâdi* (is) like (an) enemy.....(By) *vadanam* evidently here, act of accomplishment (or performance or demonstration, is) intended to be said, (and) not speaking, thus, (is intended). What does that (*vâdi*) cause to accomplish (or demonstrate) ? (It, *i. e.* the *vâdi*) causes to generate (the) Râga-property of (the) Râga.....What is called (by) that *samvâdi*-ness ? By (the) *vâdi* note (of a Raga) what Râga-function (is) produced (or grown), (the) performer-function (of) that, evidently,

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of other (*i. e.* all other, *ibid.* Cal. commt., *i. e.* all other five, *ibid.* Poona Commt.) notes, (2) or of the two ri and dha only, the (above) two ni and ga would be *vivâdis*, (3) or of these two ni and ga, the two ri and dha, also, would be *vivâdis*. Kallinâtha in *ibid.* Poona Commt. has said that, above version (1) **कथनं तु समश्रुतिकयोरेव संवाद इति मतानुसारेण।** *i. e.* (so) speaking, however, (does be) by following, this manner (of) doctrine, (*viz.*), of similar *sruti*-ed indeed (be) *samvâda* (*i. e. samvâdi*-relation), and that from above version (2) **अतो द्वादशाष्टश्रुत्यन्तरितत्वमात्रमेव संवादिलक्षणत्वमिति सिद्धं भवति।** *i. e.* from this (version) every case (of) twelve or eight *srutis*-intermediated-function (do be) *samvâdi*-indication-symptomed, this manner (of theory) does be fulfilled (or demonstrated or indicated). Continuing, Kallinâtha, regarding above version (3) says,—**एतेनैकश्रुत्यन्तरितौ परस्परं विवादिनाविति लक्षणं सूचितं भवति।** *i. e.* by this (version), (the) two (notes) one-*sruti*-intermediated (or, with one-sruti-between), (do be) mutually *vivâdis*, this manner (of) theory, does be signified. (See S. R. Poona I, iii, 51-52 commt.).

(1) **यद्वादिना** ; (2) **समुदितं** in S. R. Cal. I, ii, 47 Commt., (3) This portion within brackets, is taken from *ibid.*, there are errors and omissions here in above Brhaddesi. (4) This **रस्थाने ऋषभः** reading is taken from quotation of same sentence, in slightly different language in S. R. Cal. I, ii, 47 Commt.. The reading here,—in above Brhaddesi, is **रस्थाने पञ्चम ऋषभः**, that is obviously incorrect.

(would be) *samvâdi*-ness. *Samvâdi* use (or application), (is) as,—In which *gita* what sa (does be) attributed with *ansa*-ness, in place of that (sa), ma being done (*i. e.* acted, or applied, or supplied), (that substitution) would not be hurter (of *i. e.* injurious to the) Râga (of that *gita*). In which place (of that, or such a, *gita*), from subservience to (or subjection, or control of) *moorchhanâ*, ma (be) applied, in this place (of ma) sa being done, (that substitution) would not be hurter of (*i. e.* would not harm) (the) *Jâti* (or) Râga (of that, or such a, *gita*). In place of (the) two, sa (or) pa, (the) two, pa (or) sa (respectively, one for the other, *i. e.* pa in place of sa, or sa in place of pa) being applied, (both) do not be injurious to (the) *Jâti* (or) Râga (of such a *gita*). Thus, in place of (the) two ri (or) dha, (the) two dha (or) ri (respectively), being applied, (both) do not be destructive of *Jâti* (or) Râga. Thus, in place of (the) two, ga (or) ni, (the) two, ni (or) ga (respectively, being applied similar would be the case). By dha *ansa*-ness (*i. e.* being *ansa*-note) of *Kakubha* (Râga), (and) by ri *ansa*-ness of *Revagupta* (Râga), and from these both-Râga-mother, from acceptance (of) ri *ansa* (note), from (or, of) *Arshabhi-Jâti*, and both mutually related (probably the abovementioned two notes ri, dha), being applied, (both) do not be destructive of *Jâti* (or) Râga,*.....Question. What (does be) that *anuvâdi*-ness ? (Answer). What Râga-property of (a) Râga (is) performed by *Samvâdi* (by *Vâdi* ?†) (the) demonstrator-function (*i. e.* carrying through, or accomplishing through) of that, evidently (would be) *anuvâdi*-ness.....*Anuvâdi* use (or application, is) as,—ri in place of sa, sa in place of ri, being applied, (either of these substitutions, by) devoting (to) own (real) nature, does not be hurter (of) *Jâti* (or) Raga. Dha being applied in place of pa, pa being applied in place of dha (either) would not be hurter (of) Râga. Dha being applied in place of sa, sa being applied in place of dha, (either) does not be destroyer (of) *Jâti* (or) Râga. Ri being applied in place of pa, pa being applied in place of ri, (either) would not be hurter (of) *Jâti* (or) Râga.....What is called (by) that *vivâdi*-ness ? By *vâdi* &c. notes, what *vâdi*-ness, *samvâdi*-ness, *anuvâdi*-ness (either of these) of Râga (is) obtained (or attained), (the) destroyer-function (of) (either one or other of) that, evidently (would be) *vivâdi*-ness..... *Vivâdi* use (or application, is) as,—ga being applied in place of ri, ri being applied in place of ga, (either) would be hurter (of, *i. e.* be injurious to) *Jâti* (or) Râga. Ni being applied in place of dha, would be hurter (of) *Jâti* (or) Râga. In this manner (be the cases) in *Shadja-grâma*" (*ibid.* Brhaddesi pp. 13-16. Thereafter examples and tables of *Madhyama-grâma vâdi, samvâdi* &c. notes are given, but in these, and also in similar examples and tables for Shadja-grâma in Brhaddesi pp. 14-16, there are serious errors in readings).

Regarding *vâdi* &c.—as king &c., S. R. and its Cal. Commt. speak as follows,—"...वादी राजाऽत्र गीयते ॥ सम्वादी त्वनुसारित्वादस्यामात्योऽभिधीयते। विवादी विपरीतत्वाद्वीरैरुक्तोरिपूपमः। नृपामात्यानुसारित्वादनुवादी तु भृत्यवत् ॥" (S. R. Cal. I, ii, 47-48 ; *v. c.* S. R. Poona I, iii, 51-52). "राजा यथा मुख्यस्तथावादी अन्येषां तदनुसारित्वात्। संवादी तु अस्य वादिनः प्रधानपुरुषतुल्यः। कुतः अनुसारित्वात् सहवृत्तेः। स एव अमा(अमुना ?) सह वसतीत्यमात्यशब्देनाभिधीयते विवादी तु रिपुतुल्यः विपरीतत्वात् अननुसारित्वादित्यर्थः। अनुवादी सेवकवत्। नृपोवादी अमात्यः संवादी तदनुसारित्वात्। ततोऽयमुभयानुसारी भवति।" (*ibid.* S. R. Cal. Commt.). *i. e.* "Herein (*i. e.* of the four sorts of notes), *vâdi* is sung (as the) king (or sovereign, or ruler), *samvâdi*, however, from (its) *anusâritva* (*i. e.* follower-function) is designated *amâtya* (*i. e.* minister). *Vivâdi* from (its) contrary-ness is spoken (of) by the learned (as) similar (to the) enemy. *Anuvâdi*, however, from (its) follower-function (of) King (and) Minister, (is spoken of as)

*Most probably there are errors and omissions in the readings, of this last sentence. Mother (singular number), spoken of in above, probably signified one or other of the parent *Jâtis* of either of these two Râgas. Theoretically, dha was the *ansa* note of *Kakubha*-Râga, and the three *Jâtis*,—*Madhyamâ. Panchami* and *Dhaivati* were the parent *Jâtis* of that Raga (vide Brhaddesi p. 100). Ri was the *ansa* note of *Revagupta*-Râga, and that Râga was grown of the two *Jâtis*, *Arshabhi* and *Madhyamâ* (vide *ibid.* p. 102). Sa, ri, ma, pa, dha could be the *ansa* notes of *Madhyamâ-Jâti* (*ibid.* p. 62, verse 216 ; p. 65, verses 237-38). Pa, ri could be the *ansa* notes of *Panchami-Jâti* (*ibid.* p. 64, line 9 ; S. R. Poona 1, vii, 73). Dha, ri could be the *ansa* notes of *Dhaivati-Jâti* (Brhaddesi, p. 61, verse 204). Ni, ri, dha could be the *ansa* notes of *Arshabhi-Jâti* (*ibid.* p. 61, verse 203 ; also at p. 70). Regarding *ansa* notes of some of these, and also of other *Jâtis*, there are, however, errors of readings, in other places in Brhaddesi, (*e. g.* at p. 64). The above, more than one *ansa* notes, of above particular *Jâtis*, signified, as spoken of before (by me at p. 114 notes) that within each *Jâti*, were classified some *gitas*, having one or other of these notes, as their *ansa* notes. By the above sentence, Matanga probably says that, in cases, where, not one or other of the theoretical *ansa* notes of a *Jâti*, but a note *samvâdi* to such a note, would be assigned as the *ansa* note to a Râga, within that *Jâti*, in the theory of that Râga, in such cases, that Râga would not loose that *Jâti* class thereby.

†This 'by *vâdi*' is the reading of this Matanga's text as quoted in S. R. Cal. I, ii, 47 Commt. as shown before (at p. 120 notes).

servant-like" (*ibid.* S. R.). "As (the) King (is the) principal (or chief or pre-eminent), so (does be) *vâdi*, from follower-function of others, of it (*i. e.* of *vâdi*). *Samvâdi*, however, (is), like its, (*i. e.*) of *vâdi*, chief-man. Whence? (Answer,—) from *anusâritva* (*i. e.*) from companionship (or fellowship or association). He (*samvâdi*), indeed, dwells (or stays) with that (*vâdi*), thus is designated by (the) word *amâtya* (in the original S. R. text). *Vivâdi*, however, (is) like (an) enemy, from contrary-ness (*i. e.*) non-follower-function, such is the meaning. *Anuvâdi* (is) like (an) attendant (or servant, or valet), king *vâdi*, minister *samvâdi*, from follower-function of these. Therefore, this (*anuvâdi*) does be follower of both." (*ibid.* S. R. Cal. I, ii, 47-48 Commt).

I have said before, that Somanâtha has followed Dattila and Matanga about theories of *Vâdi*, *Samvâdi* &c. In course of elucidating these theories regarding *Vâdi* as king, *Samvâdi* as minister &c., he has said,—ययोस्तु···अंतरे द्वादश···अथवा अष्टौ श्रुतयः···भवेयुः ॥ तौ···परस्परं संवा(वा?)दनाद्वादिना स्वरेण जनितस्वरागरंजकत्वस्य निर्वाहकत्वात्संवादिनौ स्तः ॥ कीदृशौ तौ ॥ अमात्यौ सचिववद्राजारब्धकार्यनिर्वाहकावित्यर्थः... (R. V. I, 37 commt.).....एकया श्रुत्यांऽतरितौ व्यवहितौ यौ तौ मिथो विवदनात्···संवाद्यनुवादिजनितरागरक्तिविनाशकत्वात् विवादिनौ भवतः ॥ कीदृशौ तौ वैरिणौ ॥ शत्रुवत् आरब्धकृत्यविनाशकावित्यर्थः ॥···शेषा येषां संवादित्वं विवादित्वं च नास्ति त इत्यर्थः ॥ मिथः अनुवदनात् वादसंवादिसंपादितरक्त्यनुकूलत्वात् अनुवादिनः स्युरिति शेषः ॥ कीदृशास्ते ॥ भृत्याः सेवकवत् राजविचारारब्धकर्मानुगुणा इत्यर्थः ॥ अनुवादित्वं यथा ॥ षड्जस्य रिगधनयः ॥ ऋषभस्य समपनयः ॥ गांधारस्य समपधाः ॥··· तेन षड्जस्थाने रिगधनिष्वपि प्रयुज्यमानेषु किंचित् रक्तिकरत्वमेवेति भावः ॥ (*ibid.* I, 38 commt). *i. e.* "Of the two (notes) between which would be twelve or eight *srutis*, (these) two, mutually, from *samvadanam*, (*i. e.*) demonstrator (or carrying through)-function of entertaining effect, generated by *vâdi* note, of (*vâdi's*) own Râga, (they) be the two *samvâdis*. Of what sort be these two? (Answer. These two be like) ministers (*i. e.*) like ministers (do be the two) demonstrators (or givers of effect to, kingly) acts taken in hand by the king.....Which two (notes be) intervened by one *sruti*, these two, mutually, from *vivadanam*, (*i. e.*) from destroyer-function of entertainment of Râga, generated by *samvâdi* (and) *anuvâdi*, be *vivâdis*. What sort (be) these two? (Answer) enemies. Like enemies (be) destroyers of commenced duties (or acts that ought to be done), such is the meaning.....The rest, (*i.e.*) of which be neither *samvâdi*-ness nor *vivâdi*-ness, these, mutually, from *anuvadanam* (*i. e.*) from favourable disposition to entertaining effect, performed by *vâdi* and *samvâdi*, (they) would be *anuvâdis*, such is the solution. Of what sort are these? (Answer) servants (*i. e.*) like attendants, congenial to court-acts taken in hand by the king, such is the meaning. *Anuvâdi*-ness (be) as,—ri ga dha ni, of sa; sa ma pa ni, of ri; sa ma pa dha, of ga.....By this, in place of sa,—ri ga dha ni (either of these) also being applied, (there) indeed (be) a little entertainer-function, such is intended." (*ibid.* R. V. I, 37, 38 Commts.).

From the above, it will be seen that *samvâdi*, *anuvâdi* and *vivâdi* were mutual relations between two notes, irrespective of these two notes, being or not being applicable in a particular *gita* or Râga. From above we also find that these ancient theories, signified that, as king, in court, being pre-eminent or pre-dominant, discharged his courtly functions with the help of ministers and servants, and that, suiting court acts, one minister might be replaced by another minister, and a servant might be replaced by another servant, without injury to the government but amongst the persons functioning or serving in that court, the replacing of one man by another inimical to him, would be detrimental or injurious to king's courtly acts, so theoretically, the peculiar characteristics of a *gita* or Râga were generated by its theoretical *vâdi* or *ansa* note, with the assistance of notes *samvâdi* and also notes *anuvâdi* to that note, and also with the application of other notes suitable to that *gita* or Râga, including notes *samvâdi* or *anuvâdi* with each other, and that, of these notes, in course of performance, development, or variations of that *gita* or Râga, one note might be replaced by a note *samvâdi* to that note, and also one note might be replaced by a note *anuvâdi* to it, without, in either case, injury to or being destructive of the particular characteristics of, or the *jâti* characteristic of, that *gita* or Râga, but the replacement of one note by another which was *vivâdi* to it, would be injurious to, or destructive of, that *gita* or Râga, or its *jâti*. From Matanga's texts quoted previously, it would be seen, that in such replacement, a *samvâdi* to the *vâdi* (or *ansa*) note might be

applied in place of the latter and also *vice versa*. I have shown before (at p. 118 notes), that Kallinâtha, in course of interpreting S. R. Poona I. vii, 32, has said that the *vâdi* might occassianally act as its own *samvâdi*, but not as its own *anuvâdi*. Sârangadeva has, however, spoken of the following case, in which, in place of the theoretical *ansa* note, a note either *samvâdi* or *anuvâdi* to that note would be applied as the *ansa* note.*

From the abovementioned ancient theories it would be apparent, that although the *vâdi* or *ansa*) note was, in theory, *bahula* (in which *bahula*, as spoken of before at pp. 78-79 and notes, was included, profusely used or predominant) note, yet, in particular cases, such as those mentioned above. where a *samvâdi* or *anuvâdi* note, of the *vâdi* note, would replace or be used in place of, that *vâdi* (or *ansa*) note, in such a case, that *samvâdi* or *anuvâdi* note would act as the *vâdi* or *ansa* note, and would theoretically take up the functions of predominance or profuse use, and that origial *vâdi* or *ansa* note would not then, necessarily have that profuse use, and might have (as in the particular cases mentioned above), *alpa*-application (in which alpa was included infrequent nse, vide p. 79 notes). Thus, in addition to the ancient theories mentioned before by me (at pp. 76-79 &c. and notes), the above-mentioned ancient theories also, support the view, as mentioned before by me (in *ibid.*), of the author of Gita Sutra Sar, that a particular Râga cannot be said to have a fixed *vâdi* (in the sense of profusely used) note, or to have a fixed *samvâdi* note, and that particular modern Râgas, such as Kedârâ and Iman Kalyân might be performed properly and in their true forms, by profusely using one note or other, as mentioned (as spoken of by me in *ibid.*) by the author. On this consideration, the **author of G. S. S.**, besides mentioning prominent cases, of some Râgas (such as those mentioned before by me at pp. 76-77 &c.) for each of which a *jân* or *vâdi* (in the sense of profusely used) note might, be assigned, **has neither assigned, nor has he given lists of,** particular notes as the affixed **VADI or SAMVADI or ANUVADI notes of** particular modern **Ragas.** This view of the author is thoroughly justified by the abovementioned ancient theories.

I have shown before (at pp. 75-76 &c. and notes) that neither a *Thât* nor a *Tâl* nor *rhythm* would identify a Râga. Indeed a Râga can be performed without affixing any *Tâl e. g.* in *Alâpa*. In performing a Râga in **ALAPA (आलाप)** form, the sounds of different phrases of the characteristic tune of that Râga, often with different variations, which in some cases are done *extempore*, are performed in instruments, or vocally sung, in *Sârgam* or *Telânâ* form, without affixing to it, any *Tâl* or any particular rhythm. Some parts of the *Alâpa* are, however, performed in some or other rhythm, but these rhythms are not affixed ones, and are changed in course of performance, suiting the taste and temperament of the player or singer. In *Alâpa* form of performing a Râga in high class types of *Dhrupad* and *Kheyal*, able musicians sometimes perform that *Alâpa* of the Râga in all the four sections of *Asthayi*, *Antarâ*, *Sanchâri*, and *Abhôg*, and in course of doing the same, they often develop the Râga with various variations of its phrases, and high class musicians generally introduce many *extempore* and *ad libitum* passages in course thereof. As a matter of fact, in performing a Râga, either in *Alâpa* form, as mentioned above, or in ordinary form, set to some *Tâl*, characteristic phrases of the characteristic tune of the Râga, are performed, but able musicians do not, except in the case of singing a particular song, set to some Râga, perform any set music or set phrases throughout, of the Râga, but after performing some such set phrases, when their minds and spirit are filled up with the Râga, they introduce many *extempore* and *ad libitum* phrases and passages, with various variations, including variations of rhythm, and they introduce such *extempore* and *ad libitum* variations in course of singing a song also, mentioned above, of a Râga. Such indroduction of

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* Sârangadeva has spoken of this, in course of describing *Ekakala* variety of Madraka class (which was one, out of the seven very ancient classes and types) of *Gitas*. After describing the two *vidâris* (*i. e.* sections), named *Mahati* and *Avântarâ*, of that *Ekakala* variety, Sârangadeva has mentioned that, in a particular *gita* of that variety, in these two *vidâris*, the *ansa* note of the *Jâti* of the Râga of that *gita* should assuredly be made the *ansa* note, but that, there being *alpa*-application in a particular case of that note, in these *vidâris* (of such a *gita*, in such a case an) *anuvâdi* or *samvâdi* of that note (should be the) *ansa* note (in these two *vidâris*). (Vide S. R. V, 74-75 and commts. and also *ante*.).

variations with *extempore* and *ad libitum* phrases and passages, are not considered in India to be of exceptional merit or ability, but to be of ordinary ability, and able musicians keep up the peculiar characteristic tune of the Râga, in course of such variations, without injuring the peculiar characteristics of the Râga, or changing to another Râga in these variations. A Râga is thus, as shown above, not distinguishable by its *Thât*, or by any *Tâl*, and a Râga is not a particular tune of any particular music, although every Râga has its characteristic tune. In this manner I have shown what a Râg is not. Then what is Râga ? I shall speak of that next.

What is RAGA. The author of this book, Gita Sutra Sâr (at Vol. I, Ch. 10, pp. 75 &c.) has said that many peculiar characteristic tunes are in vogue in India from ancient periods, and particular arrays or arrangements of these tunes have also come down to us from ancient times, and that such characteristic arrangements of such a characteristic tune, bear the technical name of a Râga or Râgini. Singing either in a song, or in *Sârgam* or *Telânâ*, or playing in instruments the characteristic arrangements of the characteristic tune of a Râga, set to some *Tâl*, is the performance of the Râga in ordinary form. Without, as mentioned before, affixing any words of a song, or *Tâl* or any particular rhythm, the performing, says the author (in *ibid.*) the sounds, of notes and other sounds, of such characteristic arrangements of the characteristic tune of a Râga, is termed performance of that Râga in *Alâpa* (**ALAPA, आलाप**) form. The author has also said (in Vol. I, Ch. vii, pp. 43, 44, 45 &c) that, as a general rule, these characteristic tunes originated from folk-songs and local and provincial music, whose tunes, in course of time, were arranged and developed by musicians, through which, tunes of some Râgas have changed in course of time, as the author says (in *ibid.* Ch. VIII, pp. 50, 56 &c.) and some Râgas have gained in volume and extent (*ibid.*), while others, having recently come in vogue (as he says in *ibid.* Ch. IX p. 66 and Ch. X, p. 82 &c.) such as Râgas *Pilu, Bârnôâ, Lum, Jhinjhôti* (or *Jhnijhnit*), *Mâru* &c. have remained short, and some Râgas (as he says in Ch. VIII, p. 50 &c.) having been not long in use, have become extinct. This extinction says the author (in *ibid.* and at p. 57) is due to the practice not being in vogue, of recording examples of Râga in notation. Indeed, even, amongst the Râgas exemplified by the author in this Vol II. of Gita Sutra Sâr, of those that were common and in practice in the author's time, many are either not now heard at all, or heard to be performed in very rare instances, and these would have, long been extinct, and would, except by these records in notation by the author, have been lossed for ever. In ancient Sanskrit books on music also, excepting *Mârga*-Ragas, which, as spoken of before, (at pp. 64, 81, 85 and notes, &c.) and also in the S. R. text quoted below *, came from celestial sources, *Desi-Râgas*, good numbers of which as spoken of and exemplified in Brhaddesi, S. R. &c., had been in practice in ancient periods, have been spoken of as originating from, or being in pracice, as folk-songs, and local and provincial music, as would be seen from the S. R. Poona commt. and R. V. quoted Hanumat text, quoted before (at p. 85 notes) by me, and also from the S. R.

* गीतं वाद्यं तथा नृत्यं त्रयं संगीतमुच्यते ॥२१॥ मार्गो देशीति तद्द्वेधा तत्र मार्गः स उच्यते ॥ यो मार्गितो विरिञ्च्याद्यैः प्रयुक्तो भरतादिभिः ॥२२॥ देवस्य पुरतः शंभो नियतोऽ(1)भ्युदयप्रदः ॥ देशे देशे जनानां (2) यद्रञ्ज्या हृदयङ्गमम् ॥ गानं च वादनं नृत्यं तद्देशीत्यभिधीयते ॥२३॥ (S. R. Poona I, i, 21-23; *s. c.* S. R. cal. I, o, 21-23. This reading (1) is of above S. R. Cal. Its reading, in above S. R. Poona, is नियताभ्यु···The reading of (2) in above S. R. Cal. is, जनानाञ्च यत् स्याद्धृदयर···) मार्गितो अन्वेषितः दृष्टः । अनेन मार्गशब्दव्युत्पत्तिरपिसूचिता । (*ibid.* S. R. Cal. I, o, 22 commt.). *i. e.* "*Gita* (*i. e.* vocal or instrumental music), *Vâdya* (*i. e.* instrument playing, including those of stringed instruments, drums, cymbals &c.), likewise dancing, the three, are termed *Sangita*. That (*Sangita*),—*Mârga*, (and) *Desi*, in this manner, (is) of two sorts. There (*i. e.* of these), that is called *Mârga*, which, *mârgita* [(*i. e.*) 'sought for (or searched or researghed) seen (from *Sâma-veda*,—vide the succeeding S. R. Pona I, i, 25 *s. c.* Cal. I, o, 25 text, सामवेदादिदं गीतं संजग्राह पितामहः ।; vide also R. V. I, 6 commt.), By this the etymology of the word Mârga is also indicated.' (*ibid.* S. R. Cal. commt.)] by (gods) primary Brahmâ and others, (is) applied by, beginning (with) Bharata and others, in front of god Sambhu (*i. e.* Siva),, (and which is) *Niyata* [(i. e.) subjected to discipline of rules, or this *Niyata* may mean,—always] *Abhydayapradah* (*i. e.* giver or promoter of, welfare, or advancement, or bliss). What *Gâna* (*i. e. gita*, spoken of above), *Vâdya*, or *Nritya* (*i. e.* Dancing), through affection (or attachment), would be entertaining to the hearts of people, in different localities, that (*i. e.* each of these), *Desi*, in this manner (*i. e.* by this term) is designated." (*ibid.* S. R. Poona I, i, 21-23, and Cal. I, o, 21-23)

text quoted above, just now, and the Matanga's text quoted below. * Regarding *Mârga* and *Desi* Râgas, Sômanâtha (in R. V. I, 7, commt.) has said, that *Mârga* Râgas having been deformed, in course of time, suiting the pleasure of people, practically *Desi* Râgas only were to be found in practice at his time, and that in very rare instances, *Mârga*-Râgas were to be met with in practice. From this the abovementioned view of the author of G. S. S., about local or provincial origin of modern Râgas, is fully supported; and it can easily be said that, excepting fragments of vedic songs that are still heard to be sung in a few temples, which might be said to have originated from *Mârga* music, modern Râgas in practice, are generally *Desi*-Ragas, *i. e.* of local or provincial origin, and that *Mârga*-Râgas, if any excepting the above, be still in practice, these have been in course of time, changed in form or deformed, or mixed up with *Desi* Râgas and become indistinguishable from them. In this way, we see, that a Râga has its characteristic tune, but that is not like the tune of a particular music. How, then can that characteristic tune be determined? Some are of opinion that this can be done through peculiar ascensions and descensions of notes and through characteristic phrases. I shall speak of these next.

Ascensions and descensions of particular notes and **Characteristic phrases** termed **पकड,** in theory of Ragas. Some theorists, and many modern authors, are of opinion, that, there are characteristic phrases of each Râga by which a Râga can be recognised, and of the notes of the *Thât* of each Râga, there is ascension in particular order of notes and descension in particular order of notes, by which such a Raga may be recognised and distinguished. There are no doubt characteristic phrases of some Ragas, through which trained ears can recognise such a Raga, and in course of ordinary performances and also performances with various variations, in fact, through such characteristic phrases, that the individuality of such a Râga, is now and then expressed, as for example in the following :—

Characteristic phrases.

Bhairavi—स धो धो धो पधोपम पनोधोप मगोरोस। *Asâvari*—सस। रो मम प सं। नो धो प·····नोधो पम गोरो स। *Bhimpalasri* or *Bhimpalâsi*—सर नो। सस गो म। प। *Sôhini*—सं न सं रो सं···न सं रो न। ग म ग। *Darbâri-Kanâdâ*—ने। धे। नो। प। प।···गोमगोर···म पधोनो···म गो म प। र सस। *Des*—सस। र मम प न। सं सं सं ध ध ध ध। ध पप मपधध प। म ग गोगगोगर स।···। *Chhâyânat*—सस। र पप पम प। ध ध पप···गम-ध पप··· गमग ररर सस। *Hâmbir*—प मी ग मी ध···। *Kedârâ*—न। ससस मम मम म ग···मग म रर सस। *Tôdi*—गो पप मी धो। प मी गो मी। प—प।···। मी गोगो रो स। *Multân*—न। सस गो मी। प—प पमी।···। मी गोगो रो स। *Purari*—न। स सरो ग मी प···ग मी मी प प···ग म रो स।†

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* अबलाबालगोपालैः क्षितिपालैर्निजेच्छया। गीयते सा(।)नुरागेण स्वदेशे देशिरुच्यते॥ (Brhaddesi, p. 2, verse 13. The reading of above, as quoted in R. V. I, 7, commt., at (1), is याऽनु···) *i. e.* (which) by women, children, cowherds, (and) kings of kingdoms, suiting their own will (or pleasure), is sung with attachment, (that) *Desi*, in its own locality is suitable (or fit) to be pleasant (or fit to shine).

† In above, **स र ग म प ध न** are Hindusthani *sudha* sa ri ga ma pa dha ni respectively, of middle octave. **न। ध। प।** &c. are ni dha pa &c. of lower octave, and **सं रं** &c. are sa ri &c. of upper octave. **रो गो धो नो** &c. are ri-*komal* ga-*komal* dha-*komal* ni-*komal* respectively, which, theoretically, according to the author (of G. S. S.) are just semitones higher than **स र प ध** respectively. The above **मी** is *kari*-ma, which, theoretically, according to the author, is a just semitone lower than **प.** The above *suddha* sa ri ga ma pa dha ni are, as spoken of before, and also as measured by me, are the same as European just natural do re mi fa sol la si respectively. Practically, however, as actually measured by me, as I shall speak of hereafter, and as generally recognised (though not scientifically measured) by Indian musicians having fine ears, these notes, both *suddha* and *vikrita* (*i. e.* ri-komal, kari-ma &c. notes) slightly vary in pitches in particular Râgas and also in particular phrases of particular Râgas. In above, the two lines underneath the notes, represent *mir.*

The above are a few typical examples of prominent **characteristic phrases** of Râgas. There are not many Râgas, however, of which such prominent characteristic phrases can be discovered. Of those, including the above Râgas, of which such characteristic phrases can be ascertained, these phrases, in proper performances by able musicians, are **neither expressed nor recognised** by the ear, **by** mere **juxtaposition** or combination **of notes,** as exemplified above, **but** in addition to such combinations, **by** peculiar pitches, *legatos*, *mir* and similar **graces,** and divergences of **forces,** which cannot be adequately written in any notation. In these graces, the sounds pass through various shades of pitches, intermediate between the theoretical pitches of, both *suddha* and *vikrita* notes, and these are so various that they cannot be written with the Hindusthani 12 notes (consisting of 7 suddha and 5 vikrita) or with any system of notation. These shades of sounds are also so innumerable that it is not possible to scientifically measure them all, and if some be measured at all, as done by me, as I shall speak next, or by others, by finer and more accurate scientific instruments, very slight errors in measuring and so recording, and also in reproducing from these recorded values, would be inevitable. These errors, though very slight, would, as found by me, as I shall speak below, not only spoil the Râga and injure its melody, but also would, when so mechanically sounded from their measured values, be actually unmusical, relatively to the Râga, as actually performed. It is not also possible either to record the values of, or to reproduce mechanically from such values, the innumerable fine shades of pitches, forces etc. of the sounds, mentioned above. These shades of sounds of the characteristic phrases, spoken of above, can only, very roughly, be demonstrated and described. I give below, such descriptions, of some of the characteristic phrases of a few Râgas quoted above*. The theoretical peculiar ascensions and descensions of notes for particular Râgas, spoken of above, can be recognised generally in such characteristic phrases, and rarely in the body of the Râgas, and such peculiar ascensions and descensions of notes may indeed be recognised from the characteristic phrases exemplied above. Such examples, as given by me below, and similar analysis and demonstration, if pointed out, in course of actual practical performances, in addition to these performances, might be of some help in learning them. These innumerable nice shades of sounds of the characteristic phrases, and of other parts of Râgas, and their abovementioned peculiar ascensions and descensions of notes, however, can only be recognised by persons having fine musical ears, after long continued hearing, and that hearing, several times, of these Râgas, from the practical performances, either vocal or instrumental, especially vocal, of able musicians, adept in performing these Râgas in their proper forms. Even such musicians, would not practically be able

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* In the characteristic phrases exemplied above, रे in descensions in *Bhairavi*, *Asâvari*, *Puravi*, and *Multân*, and in ascension and thereafter descension in *Sôhini*, is slightly lower in pitch, deffering very slightly in each of these Râgas from the theoretical pitch of रे mentioned before. In above *mir* पस॑ of *Asâvari*, the स॑ is slightly higher than upper sa. In above *Des*, in प न। स॑ the न is slightly higher, than the theoretical pitch of ni and the *mir* at स॑ passes through pitches from slightly lower to slightly higher than that of upper sa. In *mir* धधधध each ध is slightly lower than, and in मपधध the main note ध passes through pitches slightly higher than, the theoretical pitch of ध, and in गोगगोग the *mir* passes through sounds of definite pitches intermediate between the theoretical pitches, as mentioned above of गो and ग. These definite pitches and the slightly higher or lower pitches, as mentioned above, and also of those of which I shall speak below, are so definite for each of these Râgas, in these phrases of each, that these might be characterised as peculiar notes for each of these Râgas. These pitches, however, slightly differ for each Râga. **Not being able to** properly **understand these shades of sounds,** as in the above गो and ग in *Des*, some **Indian musicians** and theorists, **differ about** the notes of **THATS, of Ragas,** like the above, each alloting different nearest *suddda* or *vikrita* notes to such sounds. In above नो। सस of *Bhimpalasri*, at नो। the *mir* passes through various shades of sounds of definite pitches, a little lower and also higher than the theoritical नो।— In above ने। धे। ने।—प। प। of *Darbâri-Kânârâ* the *mir* passes through various sounds of definite pitches, slightly lower than the theoretical pitches of नो। and धो। mentioned before. In above धध पप of *Chhâyânat* the sound passes from ध to a little higher sound of definite pitch, and then descends to ध. In ग मी ध of above *Hâmbir*, at the grace in ध the sound ascends to a definite pitch, a little higher than ध and then further ascends with mild sound, to a pitch a little

to intonate at call, not only the fine gradations of sounds, but also the sounds of definite pitches of particular Râgas, as mentioned above, if asked to intonate, such a particular sound peculiar to a Râga, independently of, and separately from, the characteristic, or other phrases of that Raga. Similarly, they would not be able properly to intonate, by performing as ascensions and descensions of notes, independently of performing such phrases, the proper form of a Râga. It is only in course of either singing or playing in instruments, such characteristic, or other phrases, that such musicians would be able to intonate properly, these peculiar shades of sounds or sounds of definite pitches, of a particular Râga. By merely performing at call, these characteristic or other phrases only, they would also, not be able to intonate their shades of sounds with that exactitude as would be required for the proper, true, and beautiful form of the Râga. They would only be able to do so, when on occasions, in course of vocally or instrumentally performing a Râga, they would be in the proper mood of, and their minds would be filled up with the spirit of, that Râga. Thus, these characteristic phrases and peculiar ascensions and descensions of notes, are matters, principally of practice. The author of Gita Sutra Sâr, was one of the pioneers of writing Indian Music in notation, and practically the only one of his times, who could write, and did write and publish in modern advanced notation, not mere skeletons, but the whole forms of high class, such as Dhrupad and Kheyal types of music of Râgas, and collected and published, in such notation, examples of the very gems of such music,

lower than ऩ and then returns to ध. In course of the *mir* मम मम म ग of above *Kedârâ*, that *mir* passes through various shades of sounds from a definite pitch, a little lower than म to that of म. In course of *mir*, ग मीमी प प of above *Puravi*, the sound passes, through various shades of pitches intermediate between these notes to and through a sound of definite pitch a little higher than the abovementioned theoretical pitch of मी. From the *Sitâr* playings of Brajanath Thakur (now dead) and of Babu Sasadhar Bhattacharya Thakur (both of Saidabad, within our town Berhampore, Bengal) I, with a sonometer made by a local carpenter and with a printed meter scale pasted on it, (which measuring instrument only, was available to me), measured the seven Hindusthâni *suddha* notes sa ri ga ma pa dha ni, as tuned and played by them, and also the five *vikrita* Hindusthâni notes ri-*komal*, ga-*komal*, dha-*komal*, ni-*komal*, and *kari*-ma, as played by them in course of playing Râgas, and also the abovementioned and also other sounds of definite pitches, differing from *suddha* or *vikrita* notes, as mentioned above, of above, and of some other Râgas. From these experiments, carried through several days, I found, that these **suddha** seven **notes** sa ri ga ma pa dha ni, **as tuned and played** by them, were the **same as** the **European just natural notes**, do re mi fa sol la si of which I spoke before (at pp 6, 7 &c.), and the dha was the same as la and not a major interval above pa or sol. I also found that in particular phrases of particular Râgas, as exemplified above, the pitches of some notes, termed from the *Thâts* of these Râgas, as sa or dha or ni, were a little higher or lower than the abovementioned pitches of *suddha* sa or dha or ni &c., and in some of these cases dha was of a just major interval above pa. In course of their playing of Râgas, I also found, that, ordinarily, the pitches of the five Hindusthâni *vikrita* notes ri-*komal* ga-*komal* dha-*komal* ni-*komal* and *kari*-ma were generally the same as those of the theoretical values as given by the author (of G. S. S.)as shown by me before, viz. the first four of these, a just natural semitone higher than abovementioned *suddha* sa ri pa dha respectively, and the last, a just natural semitone lower than pa. In some cases, however, these pitches of the first four were a just semitone lower than ri ga dha ni respectively, and of the fifth was a just semitone above ma. The sounds of definite pitches, mentioned above, differed, generally very slightly from the just natural pitches, as shown by me above, of the proximate *suddha* or *vikrita* notes. These, however, as a rule, varied so slightly for each Râga, that it was not possible for me, either to measure them accurately by the abovementioned instrument, or to record the values therefrom, with nicety of exactitude. I could not also, by playing in that sonometer, reproduce nicely and exactly, what values I thus recorded. The combined effect of both of these errors were very slight and imperceptible in terms of these sonometer measurements, yet, in course of playing, by one or other of the abovementioned *Sitâr* players in their *Sitârs*, a Râga, as exemplified above, when one or other of the sounds of definite pitches, as described above, of that Râga, as played by them, was substituted by its corresponding sound, played from the sonometer, from its recorded value, that substitution not only spoilt the Râga and its melody, but also proved to be actually unmusical. Thus, these characteristic phrases, and ascensions and descensions of notes, peculiar to a particular Râga, can only be recognised from practical performances, from their various shades of sounds of definite pitches and of shades of force &c.. They can only theoretically be very roughly analysed and shown as in above, but that would not be of any help, as would be apparent from above, unless shown along with practical performances of them.

In the Parisishta (*i e.* Appendix written by me) to Vol. I of (this book) Gita Sutra Sâr (which, as spoken of before, is in Bengali), I, by selecting from those measured and recorded by me, as mentioned above, have given the sonometer values of the Hindusthani seven *suddha* and some *vikrita* notes, and also of some, including some of those mentioned above, of the slightly different values, of both of these sorts of notes, and also of sounds of definite pitches, as mentioned above, peculiar to particular Râgas.

in (this) vol. II of his book. He did not however, give lists of either the characteristic phrases or peculiar ascensions and descensions of notes, of Râgas. These, as spoken above, are matters, to be picked up and recognised by the ear, from practical performances. What then are the elements, by which a Raga can be recognised and deferentiated from other Râgas? I shall speak of that next.

How can a Raga be recognised. I have shown that a Râga cannot be recognised merely by any theory of it about its characteristic tune or characteristic phrases or particular combinations and ascensions and descensions of notes, or *Thât* etc.. Some of these may in particular cases, be of some help in learning a Raga, if imparted along with, and in course of proper practical performance of the Râga. How then can a Râga be recognised and distinguished? The author (of G, S. S., in Vol. I, ch. VII, pp 43, 44 &c.) has said, that,—as the nationality of a person can be recognised by his spoken language, similarly people of particular localities can also be recognised by their characteristic tunes, and that, Râgas originated from collections from such characteristic tunes. The author has also (in *ibid.* p 45 &c.) said, that a Râga is not easily understood (or recognised), due to its original nationalistic peculiarity, and that, as beginners in learning a foreign language, cannot easily learn and understand the idioms of that language, similar is the case of a Râga (including Râgini) which also, unless heard in large quantities, the form of such a Râga is not felt and realised, and that, the idiom of a language does not depend upon any mysterious rule of grammar, and to unerstand these idioms, learning constantly and often, that language actually spoken by people of that tongue, is required. Similary we see, that a Râga can only be recognised and distinguished, after constantly and many times hearing it performed, especially vocally, by able artists, in its true and proper form. Theoretically, some indications of some Râgas may be given by way of analysis. As for example,—by chemical analysis, it may be said that human milk contains so much per cent more water and sugar and less fat, than these elements in cow's milk, but by adding that much water and sugar and subtracting that much fat from the latter, the latter cannot be converted into the former, as, in the constitutions of that water, sugar and fat, and besides these, in several other constituent parts there are many items in both these milks which neither can be ascertained by chemical analysis, nor can be artificialy manufactured and substituted. Some of these only can be perceived by taste, smell, touch &c.. Similarly, analytical rules, such as, ma is prominent in a particular Râga, or dha follows ni-*kômal* is ascension in another Râga, may be spoken of, but these rules only, unassisted by learning from actual practical performances of these Râgas, would not enable one to recognise them, and one Râga cannot be converted into another, by artificially adding or substituting some notes, or altering the combination of some notes, in conformity to these rules. All this is due to the fact, that, there are many elements in a Râga, besides combinations of notes or of sounds of definite pitches, and forces, peculiar intonations &c., which can neither be written in any notation, nor be comprehended by any rules of grammar. It is through all these, however, that a Râga can be recognised, distinguished, understood, and properly performed. These of a particular Râga, can only be learnt by hearing often performances of able artists, adept in that Râga. What then it may be asked, is the utility of notation for Râgas. I shall speak of that next.

Ragas in Notation. From the many peculiarities of sounds of a Râga, as mentioned above, which can only be articulated, by learning *viva voce*, many contemporaries of the author (of G. S. S.) were of opinion, that a Râga was not fit for writing in notation, and that any such writing would deform and distort it. In answer to this, the author has said,—"It is the practice in India, of learning music *viva voce*. For this reason, Indians acquainted with music, are not cognisant of the benifit (or profitable use) of notation. They can not even believe that the tune and *Tâl* of all sorts of vocal (and instrumental) music, can be written in notation, in pure form. They use to say, that Hindu Music is unwritable, and for this they raise the objection, that, if by notation a song can really be written in pure form, then, why people, by merely learning notation, be not able, on seeing (or reading) that, to sing that song justly and properly? Even many men of ability and learning fall into the meshes of the errors (or fallacies) of this argument. That, by merely being able to know and distinguish the signs &c. of notation, and to understand their purport, would generate the ability to sing, should not be held in the mind. It is on practising constantly for one

or two years, by seeing notation, that it may be practicable to sing a new song, by merely seeing the written signs (of notation). Thus, to find fault with the method of notation, or to think that writing of music by signs is impossible is the result of ignorance. Regarding written language no one does so think, that the symbols for writing a language (viz. its)—alphabet—has yet remained incomplete. But, can all be read, by depending merely on letters? Never (can this be done). Boys can not perform (properly) the reading of a drama. Not to speak of boys, amongst the gentle folk, in our country, many aged persons also, cannot do (well) the reading of a drama. For that, no one blames the letters, in which (that) drama is written. That fault is of the reader, as, he, whose acquired impressions and repeated learning (or practice or habit) is large, does easily do that reading. Thus, for every act, devoted practice (or endeavour) and acquired impressions, both of these indeed, are especially necessary. Without (or, in comformity to) distinctions of meanings of a language, innumerable sorts of pronounciations are required. In the alphabet of (such a) language, however, there are not signs for even a hundredth part of these (sounds), and to do that (*i.e.* arrange for all such signs) is also impossible. Even if that could be done, in that case, due to the defect of complexity of letters (*i.e.* due to numerous letters and signs required therefor) no one could ever easily learn a written language. Through learning by repetition (or practice, or being habituated) and acquired impressions, that deficiency happens to be automatically remedied, Many Europeans come (to India) after learning well Hindi and Bengali languages from England, but at first, no one of this country can understand their Bengali and Hindi words (or languages *i.e.* those languages as spoken by them). From this no one so thinks, that these languages are unwritable. As (one) has to learn by seeing (*i.e.* reading, from) books, likewise, in the beginning, (one) has to hear constantly from spoken words (of the language) of people. By so doing, acquired impressions grow soon. Like that of a language, it is impracticable to express by (written) signs, many of the elements of music. In this (*i.e.* music) also, these deficiencies (*i.e*, inadequacy of written signs of notation) are remedied by acquired impressions and repeated learning (or habit). It is rather easier to write music, than a language, for, it (*i.e.* music) indeed is subject to some unchangeable rules. Through pursuit of these rules indeed, writing of music can be accomplished. Those who have not cultured the writing of music, of them to have distrust in that matter (of writing) is not unexpected." (Gita Sutra Sâr. Vol. I. Author's Preface, p. 11). There must be such deficiency as spoken of by the author, for, not to speak of Indian Râgas, for music of any country, or for any good musical composition, in any system of notation, These defects have to be got over by practical learning and habit. I quote below, some of the remarks of Mr. Marx on this subject.*

* "In the performance of an exisiting composition, there appear primarily only two essential requisites; namely, that there should, in the first place, be a perfect understanding of the notation in which the composition is written, and all in connection with it, including the verbal text in vocal pieces. Secondly, a sufficient mechanial skill for the execution of what has been written. Both these requisities are indeed indispensable.....

"But we will soon discover that a third requisite is equally indispensable. It is said, even of ordinary language and writing, that '*the letter killeth, but the spirit giveth life*', obviously, because it is impossible in letters to embody the spirit. This applies to our musical notation also, in the same degree as to any other mode of writing which might be invented; for it is ascribable to the nature of the subject, rather than to any imperfection in the system of representation by means of visible signs.

"We have signs for all sounds of our tonal system, that is to say, for all those degrees of sound which we have recognised as essential, and distinguished by names. We know, however that it is possible to distinguish much more minute gradations of pitch than those specified in musical notation; that, for instance, nine distinct gradations (called *commas*) are perceptible, and have been considered as musical ratios, within the limits of a tone. All these gradations are not regularly employed in music, yet we shall shortly see that they may not only be occasionally introduced, but that their employment is, under certain circumstances, both admissible and effective. We shall find that it is sometimes proper to intonate a sound in a higher pitch than that in which it is regularly employed; we shall further observe that the closest kind of *legato* between two sounds is that of gliding from one sound to the other through intermediate gradations which in our tonal system are neither distinguished by names or characters *. [At Foot-note to this, Mr. Marx has said,—*"Every one has probably heard them often enough, though in a disagreeable manner, during the tuning of a pianoforte, when a string is drawn up or slackened." This close *legato* is termed *Mir* in India, and much of it appears in Râgas.]

Thus, Indian Râgas it would be seen, are practicable to be written in notation, in the same way as a spoken language can be written with the letters of its alphabet. It would not be possible to learn and intonate both, by learning merely from their written symbols and signs, but practical *viva voce* training, added with such writings, are of great help in the learning and teaching of both, compared with learning and teaching from mouth to mouth only, without the help of any writing. Such writings also help the memory and make it practicable to increase one's stock of knowledge. In the case of a language, a beginner, after learning at first, both from *viva voce* training and also from writings, may afterwards learn that language less and less from *vive voce* help and more from books only, and advancing in this manner, a student may learn and add to his stock of knowledge, from books only, and may read at first sight, pieces not read before, and may commit to memory from writings. Pieces so memorised, but afterwards forgotten, may also be easily re-committed to memory, from these pieces in writing. Similarly, a Râga can be learnt at first, *viva voce* or from ear to ear, helped with notation, and thereafter less with *viva voce* help and more from notation only, and advancing in this manner, one may thereafter learn many pieces of music of that Râga, from notation only, and after learning a few Râgas in this manner, he may easily learn other Râgas by that process, and may thus add to his stock of Râgas as well as of pieces of music of each Râga, and can perform at

"Again.....the duration of single sounds is not an absolute measure of time, but depends merely on thir relations to each other; and that the usual indications of movement by the superscription (*allegro, adagio,* &c.)* are only vague definitions. It is true, the metronome supplies a means of measuring the duration of sounds by absolute periods and divisions of time; but the impossibility of strictly adhering to such a measurement, in the performance of good compositions, or indeed in any, under all circumstances, will be easily perceived. Moreover, the nicer distinctions and gradations of time, as *accelerando, ritardando,* &c. admit of no definite measurement whatever. [At foot-note to above, Mr. Marx has said,—* "To this must be added, that the indications of time and movement, as employed at different times and by different composers, do not exactly coincide."]

"Neither is our notation capable of indicating the exact degree of force with which a sound, or a series of sounds, is to be played or sung. We know *forte* means louder than *piano*, but not *how loud* the former, or how much softer the latter. All these gradations of force can only be indicated by general terms; and were we to attempt the indication of the more minute distinctions, we should be obliged to crowd our notation with so many signs and letters, that, in the end, the eye would become incapable of tracing them.....Moreover, we shall soon learn that the same signs (f, p, &c.) indicate, in various passages, and under various circumstances, more or less force.

"Nor has any written language a sufficient number of letters to indicate the different gradations of spoken sounds; for example, the intermediate sounds between a and o, or b and p; in short, we perceive that no representations of sounds, either in language or music, is capable of entering into or expressing the nicer shadings of speech or thought.

"But it is in these minute gradations, these shades which imperceptibly blend together, that the gentle, gradual, and yet so powerful rise and fall of emotions reveal the inmost soul; and he who does not experience this, and convey it to his audience in his musical performance, cannot hope to arouse his auditors or himself to the just appreciation of a work of art." *Universal School of Music* by Adolph Bernhard Marx, English translation by Augustus H. Wehrhan, Part VI, Section 1st, pp. 261-262).

"Music, not having, however, to express mathematical quotations, but rather to reveal the emotions of the soul and the free action of the mind, does not, in fact, require a measure of time so mathematically adjusted; which is, indeed, rather opposed to its nature; and consequently the vague but less restrictive indications by means of general terms appear to be more congenial than a rigorous subdivision into minutes and seconds by the metronome. The musical executant, or the director of a grand performance, must indeed endeavour to conceive and represent as faithfully and earnestly as possible the spirit of the composition; hence, it is incumbent on him also to pay the greatest attention to the time indicated by the composer.

"But all ultimately depends upon his own animus and the degree in which the work identifies itself with his feelings; for from his own inspired conception alone can it be rendered with animation and effect; while, if performed according to mere abstract and mechanical rules, it remains inanimate and unanimating.....It is.....only necessary that the student should become familiar with the average degree of movement which the different technical terms for the indication of time are generally understood to express; the nicer distinctions and modifications may, and must be, confided to the proper artistic understanding of the performer, and the state of his feelings at the time of the performance." (*ibid.* Part II, Appendix, p. 85).

first sight, pieces of music of such Râgas, not practised before, and also can memorise such pieces of music. Pieces of music, or Râgas, well practised but afterwards forgotten may also be easily picked up and performed by him from writings of the same in notation. In India, although many years have passed after the publication of Gita Sutra Sar, including high class music in it, of several Râgas, in notation, yet, at present even good and celebrated artists generally get their training by *viva voce* or ear to ear method only, with very little help from notation, and so they have not and cannot possibly have a large stock of music, or of Râgas, and what stock they acquire, in order to keep up the same, these artists, especially instrument players, have generally to practise for several hours a day, some or other of what they have had learnt, so that they may not partially or totally and for ever, forget the same. It spite of all these advantages, there is, however, a possible defect from notation, and of that I shall speak next.

Possible **defect of Raga in notation** Indian artists, trained in the abovementioned indigenons system, without help of notation, generally do not perform a Râga or even a particular song of a Raga or other Indian music, each time exactly alike, but on different occasions, and even in repetitions in course of the same performance, they, whether intentionally or unintentionally or automatically, generally perform with various variations, so much so, that these repetitions if written down in notation, would not appear as the same piece of written music. On this account, it is very **difficult to write down in notation, music** performed **by** such **Indian artists.** Amongst them those, who acquire some ability, do, not only perform with abovementioned alterations in repetitions, but also with various variations, extemporisations, improvisations, and *ad libitum* passages. Thus, their music do not appear to be monotonous, like Indian or European **music, practised and played from notation,** which, **generally seem to be monotonous** after a few repetitions. Such Indian artists, however, in course of such variations &c., generally show much mechanical skill and ability, in changes of accent, rhythm, shades of pitches or other sounds, and in groupings of syllables or words, in degrees of force &c., and those of such musicians who acquire skill in some Râgas generally keep up, in course of these variations &c., the notes of the *Thât* of the particular Râga performed, without passing over to other notes, but the characteristics of the particular Râga or other music performed, and feelings and expressions, are, however, generally subordinated, or lost sight of, in course of these variations &c.. High class Indian artists, however, who become imbued with the spirit of some Râgas, do, while performing such a Râga or other music, not only, keep up the characteristics of the same, throughout the repetitions, variations &c., without injuring or destroying that Raga or music, and without trenching upon to passages of other Râgas or of other such Indian music, but also, while performing, as spoken above, intentionally or unintentionally or automatically these repetitions or variations &c. each time not exactly alike, they, often develop the Râga music, in course of these variations &c.. These they also do perform with such artistic touches and feelings and expressions at places, that such performances of theirs, not to speak of not being monotonous after repetitions, are endeared by the ears, with longing to hear again, and that longing is not diminished even after repeated hearing on several occasions, of a particular Râga or such other Indian music, or even a particular song of such a Râga or music, when so performed, by such artists. Such variations &c. by such Indian musicians, however, except in rare instances and in cases of celebrated artists, are, generally, not performed as parts and parcels of, and congenial to, the growth and development of, the particular Raga or music performed, or to the rise and fall of its feelings, expressions and emotions. In the case of European artists, on the other hand, their training being through European, artificial, equal temperament notes, and staff notation based thereon, their music, being generally reproductions from written music in notation, seem to be monotonous in repetitions, and although able European musicians perform such music with various artistic touches, feelings and expressions, yet that music also, generally appear to be monotonous after a few repetitions, and, on this account, harmonised such music, and these performed with several varieties of instruments, and fresh such music, is constantly demanded by the audience. Celebrated European artists, however, who acquire world-wide fame, do, by their own genius, overcome and rise above, their abovementioned defect of training through artificial notes and notations, and in their performances, even of music written in

notation, they, vocally or in free-toned instruments, such as the violin, violencello &c. produce just natural notes as well as other shades of pitches and of sounds, as required, and while so performing such a written music, they do so with various artistic touches and with various variations, extemporisations and *ad libitum* passages similar to those of the celebrated Indian artists, as mentioned above, but unlike the latter, these celebrated European artists produce these variations &c,, as parts and parcels of, and congenial to the growth, development, and rise and fall of the feelings, emotions &c. of the particular music performed. They perform in this manner, not only high class European music, but also, such simple, such music as, Home Sweet Home, Ave Maria &c., which are given as excercises to students and beginners, with such art and artistic variations, extemporisations &c., and feelings, expressions and emotions, that such performances of theirs, of such simple music also, seem to be like those of high class music. These performances of such European artists of both high class and also simple pieces of music, similar to the performances of celebrated Indian musicians, as mentioned above, even after repeated hearing on several occasions, do not seem to be monotonous, but are endeared with longing to hear again.

In learning Râgas or similar other Indian music, with help of notation, such freedom from the trammels of the mere written notation, and, after imbibing the spirit of such Râgas or music, such ability to freely perform the same, as such Râga or music, with various variations, extemporisations and *ad libitum* passages, and all these with such artistic touches, feelings and expressions &c, as those of celebrated Indian and European artists as mentioned above, and also these as parts and parcels of, and congenial to the growth, development, rise and fall of feelings, expressions, emotions &c., of such Râga or music, similar to that as done in performances of their music, by celebrated European artists, as mentioned above, should be aimed at. In India, the aim of music is not only such, but also higher. Of that I shall speak next.

High aim of Music of India. In Indian theory, the cognisance of the spirit and soul within the humam body, is clouded by, and mist is thrown over that, by, the bonds created by the attachment to the mere body and bodily senses, feelings and desires, and that cloud and mist may gradually be cleared up by, one or other processes of spiritual culture, such as,—prayer, worship, sacrifice, sacrificial rites, meditation &c., and also by similar other processes. The high aim of music in India is of its being employed as such a process *i. e.* through music, to be able, by clearing up the abovementioned clouds and mists, to free oneself from the attachments to the mere body and bodily feelings, senses and desires, and thereby to commune and attune with the immortal, all-pervading, all-powerful, eternal, all-permeating, &c. spirit and soul.

ALAPA (आलाप). I have spoken before (at pp. 123-124 &c.) of this *Alâpa*. By *âlâpa* type of performing a Râga, the characteristic tunes, in characteristic phrases, without being bound up in a *Tâl* or rhythm, are performed vocally, with vowel sounds or with such syllables as, *na der tum* &c. similar to those of *Telânâ*, without words or words of any song, and also performed in instruments. Although there is no *Tâl* or affixed rhythm in this *âlâpa*, yet, in practice, particular parts and phrases of it, are generally performed in some or other rhythm, which is varied at pleasure. In high class music, such as Dhrupad type, often this *âlâpa* is performed in the complete four sections of *Sthâyi*, *Antarâ*, *Sanchâri*, and *Abhôg*. For *âlâpa* in ordinary performances of a Râga however, in the beginning a few phrases only of the Râga is performed in *âlâpa* type, and thereafter that Râga is performed in ordinary type in some Tâl. In the indigenous system of India, not being helped with Râgas in notation, this beginning with *âlâpa* type, helps the musician to practise and to perform the characteristic tunes and phrases of the Râga in pure form, as distinct from those of similar or other tunes and phrases of other Râgas. Indeed, not being held bound hard and fast with any *Tâl* or rhythm, able artists, can, with this freedom produce the characteristic tunes and phrases of a Râga, with various variations, ornamentations &c. more easily, in proper form and pure type, in *âlâpa* than when performing the same Râga in ordinary form, bound up with some *Tâl*. The author of G. S. S. (in G. S. S. I, ch. x, pp. 74-77) has said that,—without performing in *âlâpa* form, the facility for

performing the characteristic tunes and phrases of a Râga, in pure from, and with various graces, ornaments, and variations, is not fully developed, but, long continued *âlâpa*, as done by some artists, happens, in practice, to be full of mere repetitions, and that should be avoided. That author (in *ibid.*) has also said that,—*âlâpa*, in Indian system is not easily learnt or taught, and hence, this *âlâpa* is considered to be the accomplishment of high class musicians, but,the author adds, that idea is due to the indigenous Indian practice of learning Râgas without help of notation, and that, with that help, *âlâpa* of a Râga, being free from the bindings of any *Tâl*, would be more easy to learn and practise, than the same Râga in ordinary type, in some *Tâl*, That author has exemplified in notation, this *âlâpa* form of some Râgas, as will be seen from the music portion of this book.

PROPER SEASON AND TIME FOR RAGA.

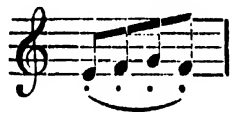
Proper time for RAGA. In India, the day, from sunrise to sunset, is divided into four parts, each of which is called a *prahar*, and the night, from sunset to next sunrise, is similarly divided into four parts called *prahars*, and these are termed 1st, 2nd, 3rd, 4th *prahars* of the day and night respectively. In Indian theory, besides proper seasons for particular Râgas, such as spring for *Vasanta* and *Bâhâr*, rainy season for *Mallâr* &c., for some Râgas, one, or two consecutive *prahars*, either of the day, or of the night, are theoretically allotted as the proper time for performance of each of these Râgas, and according to some theorists there are some Râgas, such as *Jhinjhit*, which are suitable for all parts of the day or night. In this theory of proper time there is, and during the time of the author of G. S. S., there was, difference of opinion in various parts of, and even within the same province of India, regarding particular proper time for particular Râgas. The author, by adopting the views accepted by large numbers of celebrated musicians of his time, has given in his Gita Sutra Sâr Vol. I, at Ch. ix, pp. 61-65 a list of the theoretical proper time for many Râgas. In that chapter, he has expressed his opinion that such rules for allotting particular proper time for particular Râgas are merely imaginary (see *ibid.* p. 58), and that that theory originated through long continued habit and association (*ibid.* p. 60). The author has also propounded the theory, that that habit and association arose in the following manner. Court musicians of kings, were required to perform music in different *prahars* of the day and night, in ancient times. To keep up variety for that, these musicians, not being possessed of different sweet Râgas for all occasions, made up the variety with Râgas that were sweet and also not so elegant and entertaining, and allotted particular *prahars* for particular sets of Râgas, and thus they kept alive the latter Râgas and these being played in their proper time, could not be objected to. Due to this, from hearing the performances of particular sets of Râgas at particular *prahars*, says the author (in *ibid.*), the abovementioned habit and association grew up. Tbe author has also (in *ibid.*) quoted a text of *Sangita Nirnaya*, which says that, the abovementioned proper time should be adopted for each locality, according to the practice of the elite amongst the musicians of that locality, and he has also quoted a text (in *ibid.*) from *Nârada Sanhitâ*, which says, that there would be no harm in performing Râgas at other than their theoretical proper time, when performed at order from (or as required by) the king, and also in a theatre (or place for dramatic performance). This is the view of the author of G. S. S.. For myself (the translator) however, I can say, that, some Râgas do really seem to be more elegant and entertaining at their proper seasons or time of day or night than at other periods. This may be due to habit and association. But, when performed at such other periods, this I have experienced that though they appear less sweet than in their proper parts of the day or night yet they seem in such other periods, comparatively more elegant if performed successively in their proper sequences of time, than if done otherwise. For example, while performing successively several Râgas, beginning to perform from before sunset, and continuing to some part of the night, if, at first, one or more Râgas having no allotted proper time, be performed, and thereafter Râgas of, dawn, sunrise, morning, late morning, midday, afternoon, evening, nighfall, later time of night, midnight, early next morning &c. time, and of all or of some of these

periods, be performed successively in their proper sequences of time they happen to be comparatively more elegant, than if performed in irregular order. This also happens to be the case, if some other performances, such as drama play, or dancing, or recitals or chantings of religious or similar other poems or pieces, be intervened between, vocal or instrumental playing successively, of such Râgas. I found many others to have similar experiences. Such perceptions of mine and of theirs, may be due to habit and association acquired through generations, or that may be due to there being something in the vibrations of sounds, or feelings and expression of each of those Râgas, comparatively to each other, which are the causes of such sensations.

SOME GRACES AND ORNAMENTS

AND ORNAMENTAL VARIATIONS IN INDIAN MUSIC

GITKARI (गिट्कारी), which was spoken of before (at p. 65) is an embellishment, which is performed principally vocally, as a variation. The author of G. S. S. says that, this *gitkâri* is performed, by uttering, quickly in *legato*, the sounds of some notes, either with or without grace, and also either with or without accent on each of these notes through which this *gitkâri* passes (vide G. S. S. I, vi, 41). The author has shown, the *gitkâri*, formed of *legato* with accents, in staff-notation, by a dot on each of the notes and also with the *legato* sign of a curved line beneath the notes, and by a dot on each of the notes and the *legato* sign of a straight line beneath the notes, in his adopted Tonic Sol-fa notation, thus :—



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TAN (तान), which was spoken of before at p. 65 (and also spelt as *Tâna* at p. 89), in modern Indian music, signifies a sort of ornamentation by way of variation, applied mainly in a song. The author of G. S. S. says that,—while singing a song of a Râga, leaving awhile at places, the array and combination of notes-sounds and other sounds of the words of the song, the uttering in such places, with vowel sounds such as â, e, o, and also with *gitkâri* (which has been spoken of above), the sounds of several notes, out of those notes which are applicable in that Râga, and the passing through these notes, in that manner, either in ascending or descending order of these notes; or, with the singing of some word of the song, connecting therewith by performing vocally, with such vowel sounds, as mentioned above, the tunes of other characteristic parts of the Râga, is called accomplishing *Tân*. The author has added that, the application of this *Tân* is in vogue in *Kheyâl* and *Tappâ* types, and not so in *Dhrupad* type, but some apply this *Tân* in *Dhrupad* type also, and that, as a matter of fact, songs in *Kheyâl* and *Tappâ* types being short, unless these be extended by *Tân*, and thereby a song of one or other of these types be sung for some time, that does not be entertaining. The author, in connection therewith has also said, that, *Tân*, should ordinarily be applied within one *âvarta* of the *Tâl* of a song, or on occasions extending over two such *âvartas*, and that to extend a *Tân* longer (over more nos. of *âvartas*) as some artists do, does, generally not be entertaining. (vide G.S.S. I, x, 88-89). The author has also said, that, short *Tâns* applied in instrumental music of *Sitâr* &c., are termed **UPEJ** (उपेज, vide *ibid.*). Embellishments by way of variations, similar to above *Tân*, in instrumental music of other instruments, are also sometimes termed *Tân*. This modern *Tân*, though composed of the notes applicable in the Râga, in the performance of which this *Tân* is introduced, is not, like ancient *Tânas* (spoken of before by me at pp. 84 notes, 88 notes, 100 notes &c.), confined to combinations of unrepeated notes, or to any fixed sequences of notes, but can be consisted of combinations with repetitions of notes, and though this modern *Tân*, is in practice, generally, in ascending or descending order of notes, yet it may be composed of different sequences of notes in course of such ascension or

descension. Thus, the performance of the notes of ancient *Suddha-Tâna*, and ancient *Krama* and *Kuta-Tâna*, which latter two, as spoken before (at p. 100 notes) were as of course performances of notes, may come within the category of modern *Tâns*, but, all modern *Tân* would not be the former.

BANT (बाँट), literally means (from sanskrit root *ranta*), division or distribution. This *Bânt* (as exemplified at p. 4 &c. of the music portion), is, as the author of G. S. S. says,—applied, as a matter of fact in *Dhrupad* type, and is performed by varying the array and combinations of notes and other sounds of the entire words or a *Kali* (*i.e.* section, such as *Sthâyi* &c.) of a song of a Râga, and singing these words in other characteristic tunes of the Râga, by confining these words, or syllables of these words, within each *mâtrâ* of the *Tâl* in which the song is sung (vide G. S. S. I, x, 89). The author (in *ibid.*) has also said, that, *Bânt* happens to be a sort of *Tân*, but all sorts of *Tâns* cannot be spoken of as *Bânts*, and that there is a good deal of difference between *Tân* and *Bânt*, and that in *Bânt*, the entire words of a *Kali* are used, while that is not generally so in *Tân*, and that ordinarily *Bânt* is performed with the words of the *Sthâyi Kali* (*i. e.* 1st. section). Redistributing in vocal music, and in rare cases in instrumental music, the *mâtrâs* of the *pada* subdivisions of one or more *âvartas* of the *Tâl* of the music, by varying the rhythm, into one with half, two, two with half &c. parts, and performing such variations of rhythm, one after another, is sometimes termed *Bânt*.

MIR (मिड़) and **Mir process** of playing. I have spoken before (at p. 14 notes, 95-96 notes &c.) of this *Mir* and of its being played by pulling the string across the fingerboard. This *Mir* is produced both vocally and in instruments. For the latter, Indian *Vina*, *Sitâr* &c. having long strings and long and broad finger boards (*i.e.* necks) with frets, are suitable, as in these the strings are not tuned so tightly as in European violin, violencello, guitar &c.. Thus, in these Indian instruments, the peg of the string is not loosened and so the string is not untuned in course of the abovementioned pulling of the string, as would be the case in the above European instruments and so, in the former, *Mir* is possible. In Indian *Esrâj*, *Sâringi*, &c. the strings are tuned more tightly than in *Vina*, *Sitâr* &c., but less tightly than in abovementioned European violin &c., and so in these *Esraj*, *Sâringi* &c. very little *Mir* can be produced. In these Indian *Esrâj* &c. and European violin &c., graces and embellishments somewhat similar to *Mir* are produced by gliding *i.e.* pressing and moving the left finger, lengthwise of the string, without stopping that string over the fret or fingerboard. This embellishment is termed **Glide**, and in India it is termed **Ghashit** (घषिट्). The *Mir* is played in abovementioned *Vina*, *Sitar* &c,, in the following manner,—The string being stopped by the left finger, just over a fret, or at a pulled position over the fret crosswise of the fingerboard, is struck by the *Mizrâv* (*i.e.* steel or iron wire loop plectrum worn over the tip of the right forefinger) and simultaneously with thus sounding of the string for that preliminary sound, that sounding string, without being further struck, and being kept all along pressed and touched by that left finger over that fret, is pulled or further pulled by that finger, palmwards lengthwise of the fret *i. e.* across the fingerboard (*i. e.* neck), and by this pulling, the tension on the string being gradually increased, that sounding string gradually produces sounds of higher and higher pitch, and that pulling is continued up to, and the string is stopped over the fret, (for the final higher sound) just where it produces the desired final higher sound. Intermediate sounds between that preliminary and final sounds are also produded by this process, and by suitable more or less pressure on, and stopping awhile, and by suitable more or less speed, of, the string, over the fret, in course of that pulling of the string, some of these intermediate sounds are produced more or less prominently, or with more or less speed. The preliminary sound may be, and in practical playing often is, a desired note or a neighbouring sound, and so is the final sound. The intermediate sounds also may be, and practically are, intermediate sounds, or notes, or both. While the string is so sounding in that pulled position for the final sound, without further striking it (with the *Mizrâv*) or by producing a preliminary sound by striking the string with the *Mizrâv* at a pulled position of it, by the reverse process of releasing that sounding string up to where it produces the sound of desired lower pitch, sounds from higher to lower pitches with intermediate sounds and some of these more or less prominently, or with more or less speed, may also and in practice are, produced. By performing in this way a preliminary sound, and with intermediate sounds gradually producing higher or lower

sounds or bothways alternately or in some parts both ways alternately to and fro, and in course thereof, by producing some of these intermediate sounds, more or less prominently or with more or less speed, various sorts of graces and embellishments may, and in practice are, performed. All these are termed by the general name *Mir*. By this process, by suitable less pressure of the left finger on the string, in course of pulling it over the fret, not producing intermediate sounds, and by stopping the string, with suitable pressure by the left finger, and simultaneously striking it by the *Mizrâv* worn on the right finger, at, just over the fret, and, also at, suitable pulled positions over the fret, the note for the fret, and also higher notes, and in similar reverse order, from these higher notes to that note for the fret, and these either, successively, or any of them as desired, may be played. This method of playing notes and also abovementioned graces and ornaments, are all termed *Mir process* of playing. Sometimes, for convenience, for this *Mir* process of playing, the string is pressed and pulled, over two neighbouring frets of a lower and a higher note, by the left fore and middle fingers respectively, and the *Mir*, or notes are played from the latter fret. By this *Mir* process, from suitable frets, this *Mir* grace or embellishment, or independent notes, from, the note of a fret, up to, 2, 3 or 4 higher notes, or these in reverse order, in ordinary instruments, or up to 5, 6 or more such notes in larger sized instruments having longer strings and broader and longer fingerboards (*i. e.* necks), may be, and practically are, played. Such larger instruments, in cases of *Sitârs*, are called *Surbâhârs*, and these, and large sized *vinâs*, on account of this greater facility, are more suitable for playing *Alâpas*, as in *Alâpas* of many Râgas *Mir* through several notes, abound. In notation, all the intermediate sounds or notes can not possibly be shown, and in case where the preliminary and extreme sounds are notes, these notes, and where these sounds are not exact notes, notes near about these sounds, and besides these some only of the prominent intermediate notes, can only be shown. This has been done by the author in G. S. S., and he has **shown** this **Mir by a special sign added,** viz. **two straight lines, and two curved lines in** cases of his adopted **Tonic Sol-fa** notatian **and Staff-notation, respectively,** beneath the preliminary, intermediate and extreme notes, through which the *Mir* passes (where in ordinary *legato* these are shown, and the author has so shown, by one such line, in each of these notations), thus:—

TAMBURA AND ITS SUGGESTED IMPROVEMENTS.

Tambura (तम्बुरा) or (ताम्बुरा) also termed *Tânpurâ* (तानपुरा) and its **suggested improved tuning.** I have spoken before of the *tamburâ* and its tuning and of its advantages (at p. 8) and of its defects in injuring the sweetness of the voice (at p. 31). The author (in G.S.S. I, i, 4 &c.) has described vividly this defect and the injury to the voice as a result of that. This *tâmbura* is generally used for accompaniment with *Dhrupad*, *Kheyâl* and such high type songs, abounding with various *extempore* passages and variations and *ad libitum* passages, of high class Indian singers. For such accompaniment, the open, four strings of the *tamburâ*, are successively struck one after another, generally by the singer himself, with the *mizrâv* on the right forefinger, and thereby the notes of these four strings (as spoken of before by me, at p. 8) are sounded successively, and this is done constantly in course of singing. This accompaniment, as the author (in G.S.S. I, xiii, 143) says, is very imperfect, as the notes cannot be prolonged as can be done with stringed instruments with bows, and also as, the notes of the open strings do not, in all cases, agree or harmonise with the notes of the song. The author has added, that on this account, stringed instruments with bows, are more suitable for such accompaniment. In spite of such defect and the defect of injuring the voice (as mentioned before by me at p. 31), this

tamburâ accompaniment, the author says (in G.S.S. I, xiii 143-144 &c.), came into vogue in India, on account of the above mentioned high class Indian singers not easily getting, or not being agreeable or in good terms with, such instrument players as would be able to accompany their songs, and due to the *tâmburâ* being suitable to be played by the singer himself. The author, considering, that for this reason, the *tâmburâ* would not easily be supplanted, in above cases, by a better accompanying instrument, has (in *ibid.*) suggested its improvement by addition of two more strings to it, making in all 6 strings, of which, besides tuning the two strings to middle sa, as is ordinarily done (as spoken of before at p. 8), which strings are termed *juri-târ* (*i.e.* duplicate or twin strings), he has advised the tuning of the other four strings, to suitable important notes of each of the Râgas which is sung *e.g.* (as spoken by him in *ibid.* p. 145 &c.) lower-pa lower-ni (middle) sa sa ri ga for Râga *Iman* ; lower-pa lower-dha lower-ni (middle) ṣa sa ma for Râga *Kedârâ* ; lower-pa lower-ni-*Kômal* (middle) sa sa ri ma for Râga *Kânâdâ* ; lower-pa lower-dha-*Kômal* (middle) sa sa ga-*kômal* ma for Râga *Bhairavi* &c.. The author (in *ibid.*) has advised that, with a *tamburâ* so tuned, in course of accompanying the singing of a Râga, when one or other of the abovementioned four notes (*i.e.* other than those of the *juri*-strings) would be clearly produced by the voice, simultaneously therewith that note should be sounded, by the singer striking the string tuned to that note, and that, while producing, in course of so singing, either, other notes, or some notes quickly in ascending and descending order, in such cases, the middle-sa, from the *juri* strings should be played for accompaniment. The author, in the music portion, has exemplified, with seperate notations for the songs and for a *tamburâ* so tuned, such accompaniment with such a *tamburâ*, *e.g.* at pp. 23,26 &c. of the music portion. Such accompanying, the author has said (in *ibid.* G. S. S. I, xiii, 144-145), though, would not, in all cases agree, or harmonise well with the notes and other sounds vocally sung, yet, in the absence of, or as spoken above, there being no immediate possibility of having, better accompanying instruments, that would be an improvement on the prevalent method, described above.

In this connection, I (the translator) would like to suggest an improvement of the sound of the *tamburâ*. This can be done with better material and mechanical skill, *e.g.* by using such different kinds of light, porous, and resonant wood, as, would be suitable for the belly and the bridge and by using thin planks, or two planks joined laterally, of such wood, stiffened with pieces of light wood underneath, for the belly, similar to those of European good violin, violincello, guitar, mandolin &c. and by making the bridge of such size and form, and also by making one or two sound holes, similar to those of one or other of the above mentioned European instruments, as would suit the *tamburâ*. In this way, by increasing the loudness, as well as sweetness of its sound, the threads between the bridge and strings and the jarring sound of the *tamburâ*, causing injury to the voice (as spoken of before at p. 31) could be avoided. These threads, as spoken of before (in *ibid.*) are termed *jôâri*. The harsh jarring voice, similar to the sound produced by these threads as spoken of in that connection (in *ibid.*) is also termed *jôâri*-voice or *jôâri* of the voice. Good resonance in the voice as well as of instruments, is also sometimes termed *jôâri*.

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SRUTI SWARA GRAMA MELA THAT AND THEORY OF NOTES OF GITA SUTRA SAR.

I have spoken before, that ancient Indian *Grâmas*, *Moorchhanâs*, *Tânas*, and of later periods *Melas*, and modern Hindusthâni Scale (*i.e.* Grâma) and *Thâts* were formed with some notes out of the *suddha* and *vikrita* notes of each of these periods, and that these notes were based on the theory of 22 *srutis*. I have also spoken of these ancient, and of modern Hindusthâni, notes. The author, in Gita Sutra Sâr, has, following the English Tonic Sol-fa system, used, besides the 5 Hindusthani *vikrita* notes (as mentioned by me at p. 80 notes) 5 more *vikrita* notes *viz.* *kari*-sa *kari*-ri pa-*kômal* *kari*-pa and *kari*-dha. I shall speak here of the significance in modern terms, so far as could be found out, of these ancient and Hindusthâni *srutis*, and of the values in modern terms of these notes of Grâmas &c. and also of the theoretical values of these and of the other notes of Gita Sutra Sâr.

SRUTI.

I have spoken (at p. 21 notes) of the Indian theory of 22 *srutis*, and (at p. 82 notes) of the theoretical *sruti* differences between, notes of ancient *Shadja* and *Madhyama grâmas*, and (at p. 97 notes) also between notes of Hindusthâni *suddha* scale *i.e.* *grâma*. I have also (at pp. 80-81 notes, 109 notes) mentioned that Indian musicians and theorists cannot speak definitely about the *sruti* or any other intervals of Hindusthâni *vikrita* notes. I also spoke before (at p. 21 notes) about G.S.S. author's conclusions regarding *srutis* and their values, and (at pp. 8 notes, 21-22 notes) about Mr. Deval's researches and of his and Mr. Clements' experiments and of their main conclusions therefrom and of some irregular scales including septimal intervals, and the value of each of the 22 *srutis* and the *sruti* positions of notes of *Thâts* as given by Mr. Clements. I shall now show, how far these views of Mr. Deval and of Mr. Clements could be justified.

Mr. Deval and Mr. Clements on Srutis and Notes.—What I spoke before (at pp. 8 notes and 21-22 notes) about Mr. Deval's researches and conclusions, was on the following observations of Mr. Clements,—"Mr. Deval constructed a diachord.....of two wires.....over a sounding board.....one wire being provided with a graduated scale and a movable fret.....His method was to tune both wires to .....that of the shadj of the singer assisting him. He moved the fret of the wire which had the graduated scale into the position which gave the note which the singer had been asked to sing. A simple calculation from.....the sale.....gave him comparative vibration-number of the.....note.....He persevered for years at this investigation, deriving assistance from many of the best singers that India could produce.....Mr. Deval published his conclusions in "The Hindu Musical Scale and the Twenty-two Srutees" (*Intro. to Ind. Music*, I, 6-7). On procuring and reading Mr. Deval's that book *The Hindu Musical Scale and the Twenty-two Shrutees* (Arya Bhusan Press, Poona, 1910, pp. 49 with Introduction by Mr. Clements pp. i-v), however, I did not find, except, in mention, in Mr. Clements's Introduction to that book, of some experiments on the practical music of a few Indian musicians by Mr. Deval and Mr. Clements, any other description or record of these or any other practical experiments. In that book Mr. Deval has given values in vibration frequencies of 22 *srutis* and of *suddha* and *vikrita* notes based thereon. After perusing that book, I could procure Mr. Deval's "Theory of Indian Music as expounded by Somanâtha" (Aryabhusan Press Poona, 1916, pp. 64 and also Tables in Appendices). In that book Mr. Deval, basing on some texts of Râga Vibodha and of other Sanskrit books, has given Tables of vibration frequencies of 22 *srutis*, and of *suddha* and *vikrita* notes of Râga-Vibodha. I found no mention of or any record of any practical experiments in that book also. With regard to the R. V. and other texts, on which he based his above mentioned values for 22 srutis, in that book, I found several inaccuracies in his quotations and interpretations of these texts, which, when corrected would lead to quite different conclusions, and would show that much of these values for srutis of his, were based on wrong foundations. In that book, Mr. Deval, not to speak of not explaining, has not even mentioned the notes one-*sruti*-apart *i. e.* in consecutive *srutis*, as can be found in some *Melas* of R. V. &c.. I have spoken before (at p. 107) of the difficulty of alloting modern values

to such notes of such *Melas*, and in R. V. out of its 23 *Melas* as spoken of before (at p. 111), in 10 *Melas* there are either one or two pairs of notes one-*sruti*-apart. If to the srutis, to which such one-sruti-apart notes are alloted in R. V., the values of srutis, as given by Mr. Deval in his above mentioned book, be given, that would only lead to confusion. I have discussed in detail, these fallacies of Mr. Deval in the Parisishta to Vol. I of G. S. S..

At pp. 7-8 of his Intro. To Ind. Music, Mr. Clements has given in a Table the comparative vibration numbers for each, of what he has termed 'The more common of the modern *srutis*, in which he has included 22 *srutis* with ancient *sruti* names (as found in S. R.) and additional 3 srutis without such names, and to each of these 24 he has alloted a modernised Indian note name, and also a European and an Indian note sign, with his own coined notation sign added to most of these.

From that book of his, I found nothing else, in support of these values and of these allotment of notes of his, to each of these *srutis*, except,—his mentioning of Mr. Deval's research spoken of above, and also that by that research, the main conclusions were, that, besides some irregular scales, in the *Thâts* and notes of Indian musicians,—2, 3 and 4 *srutis* were equivalent to just natural semitone, minor, and major intervals, respectively, and that, Mr. Clements, with collaboratian of Mr. Deval, with a special harmonium, with extra keys, and especially made and tuned for the purpose, having got accompanied, the songs of some Indian singers, found, the *Thâts*, both regular and irregular, as given, as spoken of above in his Intro. To Ind. Music, to be correct (vide Intro. To Ind. Music, pp. 6-7). By calculating ratios between different *srutis* and notes from the above mentioned vibration numbers as given by Mr. Clements in his above book, for above mentioned 24 srutis, we get only simple harmonic ratios, of which a few are found to be septimal, and the rest are found to be either 9 : 8, 10 : 9, 16 : 15 or combinations of, or difierences between, these intervals. From my practical experiments, spoken of before (at p. 127 notes) I found, as has also been spoken of before (at p. 116 notes), that the intervals between many notes of several modern Hindusthâni Râgas, were not confined to such simple harmonic ratios.

At p. 77 of his Intro. To Ind. Music, Mr. Clements has given a Table of his comparative vibration numbers for 22 *srutis* of Sangita Ratnâkar, of which he has given two values each for the 1st, 10th and 16th *srutis* and one value each for the rest, and to each of these values he has assigned an Indian note name, with his adopted signs added. I could not find from this book any proof or reasons or calculations for these vibration numbers of his, excepting a few calculations based on his assumption as of course, that the ratios of interva's between ancient srutis and notes were simple harmonic ratios similar to those assumed by him for modern srutis and notes as spoken above. For example by assuming without giving any reason, that the ratio of the 6 *srutis* from ma to dha of ancient *Gândhâra grâma*, was 6 : 5, he has accepted the ratio of 10 : 9 for 3 srutis from ma to pa, and 27 : 25 for 3 srutis from pa to dha of that *grâma*, and for these notes he has also suggested as an alternative, ma to pa 11 : 10, pa to dha 12 :11 (vide Intro. To Ind. Music p. 57). On that assumption and such calculation on that basis, and similar assumption for *Grâma-Sâdhâran*, Madhyama-grâma &c., Mr. Clements has taken as of course "that the ancient system required 25 srutis, and not 22, three of them being confounded with their neighbours" (*ibid.* p. 101). Where these assumptions, and assertions of his based thereon, did not tally with descriptions and theories of ancient Sanskrit books, Mr. Clements, for many such cases, has found fault with the theories of these ancient books. Of this I give a few examples,— "Dividing *Grâma Sâdhâran* into two parts" (*i. e. Shadja* and *Madhyama Sâdhârans* by Sârangadeva) "appears to be merely pedantic (*ibid.* p. 60). ".....two treatises had appeared in the South, the Svaramela Kalânidhi of Râma Amâtya, of about 1550, and the Râga Vibodh of Somnâth, of 1602.....Their tuning was in shadj. They knew of the Ratnakar, and looked upon it as a work of great authority, but they appear to have been entirely ignorant of the fact that it was based upon a different system of tuning from their own.....Counting up the srutis from 'ni', the author of Râga Vibodh said his sâ was on the fourth, the ri on the seventh, the ga on the ninth, and so on, copying from Ratnâkar, and never imagining that they had another scale in Hindusthân." (*ibid.* pp. 80-81). These and such other opinions of Mr. Clements were due to his above mentioned assumptions and conclusions on that basis. In the Parisishta to Vol. I (of G. S. S.), by discussing these and some of other such views of Mr. Clements, I have shown that these fallacies did not lie with these ancient authors or with these ancient systems, but that these opinions of his were due to Mr. Clements' not properly understanding these ancient authors and systems.

In his (Bombay University) Lectures, Mr. Clements has given ratios of intervals and also of *srutis*, and values of notes of *Thâts* of some (Hindusthâni Râgas), and for purpose of these, he has started on the assumption, as he says,—"I proceed on the assumption, which I find is amply justified, that the (*sruti*) numbers stand for simple harmonic intervals." (*ibid.* Lectures p. 28). Thereafter, by accepting the 13 and 9 *srutis* between *samvâdis*, as "the most consonant of all intervals" (vide *ibid.*), Mr. Clements has said,—"There can be no doubt whatever that by thirteen *srutis* is meant the fifth (*sâ* to *pâ* of the tambura) and by nine the fourth (*pa* to upper *sâ*, or sâ to *ma komal*)." (By this ma-kômal Mr. Clements means, what in Bengal is termed *ma* natural). "The difference between them is the tone of four srutis (9 : 8). So far the question admits of no dispute." (*ibid.* p. 29). Proceeding in this manner, Mr. Clements has said "I may say without contradiction that anyone practically acquainted with musical intervals would exclaim at once : seven *srutis* must mean the true major third, 5 : 4. If this is so, the whole *sruti* system is revealed." (*ibid.* p. 31). Thereafter by taking these ratios and also the ratios 3 : 2 and 4 : 3 for 13 and 9 srutis respectively and 2 : 1 for 22 srutis, Mr. Clements has given the ratios 16 : 15, 10 : 9, 9 : 8, 32 : 27, 6 : 5, 5 : 4, 81 : 64, 4 : 3, 3 2, 2 : 1,—for 2, 3, 4, 5, 6, 7, 8, 9, 13, 22 *srutis* respectively. Besides alloting such ratios in these "Lectures", for notes of some modern *Thâts*, Mr. Clements has also alloted for particular such *Thâts* other ratios on that basis (*e. g.* 27 : 25 at p. 39, and p 40 footnote), and also some septimal intervals (*e. g.* 21 : 20, 28 : 27 at p. 39). Mr. Clements at p. 38 of these 'Lectures' has said, that

with harmoniums especially tuned to notes of intervals as above, by himself experimenting with the practical music of some Indian singers, with collaboratian of Mr. Fredilis, having "time at (their) disposal... exceedingly limited" (*ibid.* p. 38) he found the *Thâts* of some Râgas to actually have intervals as shown by him in *ibid.* p. 39, in which he has given avove mentioned and similar ratios for intervals. In that connection Mr. Clements has also said that from similar experiments, with similarly tuned harmoniums, he, and others of the 'Philharmonic Society,' "have tested the scales" (*i.e. Thâts*) "of three or four Indian singers by taking the nearest natural scale to that of the *râga* in which they were singing and asking them to point out what differences, if any, they could perceive..... ..I have in this way satisfied myself regarding the intonation of a great number of Indian scales" (*i. e. Thâts*). "I do not expect others to accept my results without verification," (*ibid.* p. 38). I have spoken before (at p. 127 notes), of my own experiments and that from these I found the Hindusthâni natural notes sa ri ga ma pa dha ni to be the same as European just natural do re mi fa sol la si. From these experiments I also found that in *Thâts* of Râgas which included *vikrita* notes, intervals of notes of some such *Thâts* bore such simple harmonic ratios as spoken of by Mr. Clements, but that notes of several other such *Thâts*, would, as spoken of before by me (at pp. 116 and 127 notes), be found to have various complicated ratios of intervals which would not be confined to the simple harmonic ratios spoken of, as shown above, by Mr. Clements, and that to make them tally with his above mentioned assumptions, he has forced some ratios of intervals between notes of some Râgas to fit in with the simple harmonic ratios as given by him.

In the above mentioned books of Mr. Deval and Mr. Clements, besides what have been spoken above, there are very little more proofs, or reasons or record of experiments, to show how far they were justified in their assumptions for above mentioned simple harmonic ratios for intervals of ancient and modern *srutis* and notes, and for the figures for vibration Nos. &c. based thereon, as given by them, and in none of these books is there any practical example of music in notation of any Râga.

What are SRUTIS in modern terms. Long before Mr. Clements, the author of G. S. S. in Vol. I. had shown, as spoken of before by me (at p. 21 notes), that in the Indian system of an octave of *22 srutis*, 4, 3, 2 srutis between notes, generally signified in rough measures, just natural major, minor, and semitone intervals, and that 1, 2, 3, 4 &c. srutis did not mean or prove the existence of third, quarter or other microtones, in Indian music. That author had also expressed his opinion that ancient *samvâdis* of 13 and 9 *srutis* signified just natural major fifth and fourth respectively. He had also, by quoting the verse of *Sangitasamayasâra* from S. R. Cal. commt., (which I shall quote just now) shown in G. S. S. I, iv, 25, what from other S. R, texts I have shown before (at p. 98 notes), *viz.* that in ancient systems, each of the **22 srutis,** was **not necessarily a note or tone.** In his (Bombay University) Lectures at p. 28, translating, Commt. of Bharata's *Nâtya Sâstra*, ch. 28, verse 23, as,—"*Svaras* between which there is a distance of nine or thirteen *srutis* are *samvâdi* to each other", and thereafter saying that S. R. I, iii, 51 "tells us that *samvâdi svaras* have eight or twelve *srutis* between them", Mr. Clements has said,—"In this passage the *sruti* is spoken of as a note, in the earlier treatise (*i.e*, of Bharta) it was an interval. To have eight notes between is the same as having nine intervals." (*ibid.* 28). That passage, is in S. R. Poona I, iii, 50, where Sârangadeva has said,—"Of those (notes) between (which) twelve or eight *srutis* are perceptible, they be mutually *Samvâdis*". By that passage, as shown by Sinhabhupâla in *s.c.* S, R. Cal. I, ii, 46 commt., and also as mentioned by me before (at p. 119), Sârangadeva has only said in a different language, what had been said by his previous authors, by,—notes 13 or 9 srutis apart being mutually *samvâdi*. Indeed, Sârangadeva, like his previous authors, though he has alloted particular *suddha* or *vikrita* notes to particular *srutis*, has nowhere said that the intervening *srutis* were either notes or equal divisions. In S. R. Poona I, iii, 11—23, *s.c.* Cal. I, ii, 10—21, Sârangadeva has shown, how, by practical experiments with two *vinâs*, one duplicate of the other, ideas of 22 *srutis* and of *srutis* between notes may be had. From these texts, as explained in both Poona and Cal. Commts., and as shown with discussions of these texts and commts. by me in the Parisishta to G. S. S. Vol. I, it appears, that Sârangadeva, had shown in these texts, only rough and ready practical experiments for above purpose. He has neither said nor shown therein that 22 srutis were equal divisions or that each of the 22 srutis was a note. Sinhabhupâla, as shown below, has shown on the contrary, that each *sruti* could not be vocally sounded, *i e.* was not a note*. I, in the *Parisishta* to G. S. S. Vol. I, by quoting

*In S. R. Cal. I, *ii*, 10 Commt. (*s.c.* Poona I, iii, 11), Sinhabhupâla, in explaining that S. R. text about duplicate *vinâs* for abovementioned practical experiments for *srutis*, has said,—दृष्टान्तेन विना एते नादविशेषा दुरवबोधाः कथंचिदपि

and discussing in detail, texts of S.R., S.P., R,V. &c. have shown what meaning, in modern terms could be deduced, of the ancient and modern system of 22 *srutis*. My main conclusions, as shown therein, were—that these *srutis* were merely rough measures excluding fractions, of intervals between notes, that 22 srutis were not equal divisions, and that 4 srutis interval was not double of, and 3 srutis were not one and a half times of, 2 srutis intervals,—that these 22 srutis, or 2 or 3 added srutis as done by Mr. Clements, were also not unequal divisions having relatively fixed ratios, and that,—to allot such fixed ratios or pitches to these, or a key of a harmonium or of such other instrument, to each, as, or similar to those done by Mr. Deval and Mr. Clements, as shown above, would only lead to confusion in the matter of explaining, or affixing the values of ancient and modern *suddha* and *vikrita* notes, and also of notes of *Melas* and *Thâts* which include *vikrita* notes,—that the intervals between notes of several modern Hindusthâni Râgas, were not confined to such simple harmonic ratios, as alloted, as mentioned above, by Mr. Deval and Mr. Clements,—that from my practical experiments (of which I have spoken above), I found, what was also previously found as spoken of before by me (at p. 6 notes) by Sir William Jones and the author of G. S. S., that the natural notes of the modern Hindusthâni *grâmâ*, sa ri ga ma pa dha ni were the same as European just natural, do re mi fa sol la si, and that from this, in terms of theoretical srutis, between Hindusthâni notes, spoken of before (at p. 97 notes), it may be said that of these notes, pa to dha was 3 srutis and that the srutis between these Hindusthâni *suddha* notes were,—sa 4 ri 3 ga 2 ma 4 pa 3 dha 4 ni *sa*,—that from these notes being the same, as spoken of before, as the European just natural notes, it may be said, on reference to the intervals between the latter notes as spoken of before (at pp. 6, 28, 29 &c.) that the above 4, 3, 2 srutis, and, of above, sa to pa 13 srutis, and sa to ma 9 srutis, were, equivalent to just natural, major, minor, semitone, major fifth, and major fourth intervals, of ratios of 9 : 8. 10 : 9, 16 : 15, 3 : 2 and 4 : 3 respectively, and that similar combinations and differences of these srutis were the same as combinations of, and differences of, these equivalent ratios, *e.g.* sa to ga 7 srutis of above, was of 5 : 4 ratio,—that, as spoken of before (at pp. 81 notes, 109 notes &c.) Indian musicians and theorists cannot speak definitely, but do so loosely about srutis of the five Hindusthâni *vikrita* notes, and that being confined within 22 srutis, such srutis between these notes or their values, can not be so definitely spoken of, as done for *suddha* notes, as shown above, —that the intervals of these *vikrita* notes, and of those of these, and also of *suddha* notes which, slightly differ in different Râgas, can be spoken of or indicated in modern values, in such manner as done by me before (at pp. 125-27 notes),—that regarding **srutis of ancient notes,** from the fact, as found from S.R., S.P., R.V. &c., that the tuning of strings in those ancient periods was in relations of sa to pa, sa to ma, or ma to sa. and that these sa to pa and sa to ma were *samvâdi* relations of 13 and 9 srutis respectively, as are also the cases, in the modern Hindusthâni system, it leads to the strong inference that these sa pa and ma were the same in both *i.e.* ancient sa to pa, and sa to ma intervals were, just natural, major fifth and fourth of 3:2 and 4:3 ratios respectivly,—that from the srutis of the other ancient *suddha* notes and of the notes of ancient *Madhyama grâma* (as shown before at p. 82 notes) it is seen that their srutis were composed of 4, 3 or 2 srutis, no two 3 or 2 srutis being placed side by side, as is the case of modern Hindusthâni notes, as shown above, and that the sequences of srutis of the former were similar to those of the latter, formed of three 4 srutis, two 3 srutis, and two 2 srutis in an octave, that this leads

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दर्शयितुमशक्याः तस्मात् वीणा-द्वन्द्वदृष्टान्तकथनं···तदुक्तं संगीतसमयसारे "ते तु द्वाविंशतिर्नादा न कण्ठेन परिस्फुटाः। शक्या दर्शयितुं तस्माद्वीणायां तन्निदर्शनम् ॥" इति (S. R. Cal. I, ii, 10 Commt., *s.c.* Poona I, iii, 10-11) *i.e.* "without illustration, these especial sounds (of 22 *srutis*), are difficult to be perceived, in throat (*i.e.* voice) also, to cause (or make) to see (*i.e.* to perceive, these, is) not practicable (or feasible), thence (or therefore, is) the saying (in the original S. R. text, of the) practical illustration in duplicate *vînâs*.....It, is spoken in Sangitasamayasâra, 'these twenty two sounds, indeed are not clearly (or all round distinctly) manifest by the throat (*i.e.* voice) thence (or therefore) to cause (or make) to see (or perceive), their practical illustration is practicable (or feasible) in *vînâ*.' (*ibid.*)." N.B. This and other texts of *Sangitasamayasâra* as found quoted in S. R. Cal., are not to be found in the *Sangitasamayasâra* printed in Travancore, of which I spoke before (at p. 86 notes). That may be due to the two books being different, or to the latter being incomplete.

to the strong inference, that the values of these 4, 3 and 2 srutis, and of combinations and differences of these srutis, of these ancient notes, were the same as those of the 4, 3 and 2 srutis of modern Hindusthâni notes, as shown above, *i.e.* of ratios of 9:8, 10:9 and 16:15 and combinations of, and differences of, these respectively,—that besides *trisrutih*-pa of above mentioned ancient *Madhyama-grâma* in that *grâma* only, two other ancient *vikrita* notes *viz. anatra*-ga and *kâkali*-ni only, were applied, and both the *suddha* and *vikrita* forms of these three notes were not simultaneously applied, as spoken of before (at pp. 96-97 &c.) in theories of Râgas in S.R., and that from the srutis of these three *vikrita* notes (as shown before at 98-99 notes) it would be seen that these were either 4, or 3 or 2 srutis from their neighbouring *suddha*-notes, and that by displacing the *suddha* forms of those notes by these *vikrita* notes, in either *Shadja* or *Madhyama grâma*, it would be seen that the sequences of their srutis would be formed of 4, 3 and 2 srutis, similar to those of modern Hindusthâni *suddha* notes and of ancient *Shadja* and *Madhyama grâmas*, as mentioned above, that this leads to the strong inference that the values of these 4, 3 and 2 srutis and the combinations of, and differences of, these srutis, of these three ancient *vikrita* notes were the same as mentioned above,—that beyond inferring that generally these were the values of these, and combinations of, and differences of, these 4, 3 and 2 srutis of these ancient *suddha* and *vikrita* notes, to calculate therefrom or from their combinations and differences, and to affix thereby one or two such values to each of the 22 srutis, would lead to confusion, *e.g.* that would not explain the values of all of the *vikrita* notes of S.R., and of other ancient books such as S.P., R.V. &c.. As an example of this, it may be said that assigning values in this manner, to the 1-*sruti*-apart notes as found in some *Melas* (as spoken of before at p. 107 &c.) of R.V. &c., would not total exactly, the ratio of 2:1 for an octave, for many of such *Melas*, and to try to make these agree, would only lead to confusion,—that the one sruti of these 1-*sruti* apart notes might, it may be inferred, have signified less than a semitone similar to those of some modern *vikrita* notes as found by me, as spoken of before (at pp. 125-27 notes) of some modern Râgas, or that some of these ancient, one srutis, might have really been equivalent to 2 srutis or a semitone, but were loosly placed one-sruti apart in assigning the *suddha* notes and all the *vikrita* notes, of each of these ancient books, within the circumscribed limits of 22 srutis,—that such values for these one-srutis should only be accepted after proper tests and proofs, when available.

Ratios of notes from ancient books. I have shown before (at pp. 91-92 notes, 95-96 notes) that in S.R., only rough measures has been given for distances between frets for *vinâs* and holes of *vansas*, from which, any reliable ratios for notes cannot be ascertained. In *Sangita-Pârijata* at verses 313-27, ratios and measures for placing frets for *suddha* and the *vikrita* notes of that book are given. By quoting and discussing these texts in detail, I have shown in G.S.S. Vol. I, *Parisishta* Ch, v, pp. 316-318 &c. that the ratios of 1:2, 2:3, 3:4, 5:6, 7:12 are obtained from these S. P. verses, for the distances of frets for *suddha* notes, sa to upper-sa, sa to pa, sa to ma, sa to ga, sa to dha respectively, and that from these ratios and from such ratios for *vikrita* notes as can be deduced from these verses, different values for 5, 4 &c. srutis between different notes of that book, are deduced. I may mention here that Mr. Deval, in his "Hindu Musical Scale And 22 Shrutees", has spoken of and explained only the verses giving the above mentioned ratios 1:2, 2:3 and 3:4 only, but has not mentioned, not to speak of explaining, the other of the above mentioned ratios, or the fact, that from these the above mentioned different values may be deduced. As the tension on the string must have varied in playing notes from different frets, such measures for distances for frets, must have been only approximate, and much reliance should not be placed in the matter of tuning by placing frets, or for ascertaing ratios of notes, from the descriptions of distances for frets, as given in that, or such ether ancient books, or as similarly given in some modern Sanskrit books on modern Indian music. The only reliable ratio for notes that I found from ancient books, was the ratio of the upper-octave-note being, *dvigunah* (द्विगुणः) *i.e.* two times of its next lower-octave-note, as spoken of in S. R. Poona, I, vi, 7; III, 190; VI, 455, and in that book, in connection with notes played from *vansas*, this upper octave note has been termed the *dvigunah-svarah* as mentioned before (at p. 92 notes, spelt there as

dwigunah). I could not find any mention in S.R., of any unit, such as of vibration frequencies &c. of which the above ratio was spoken of. In Commt. to S.R. VI, 453-56, regarding Sârangadeva's description of playing, from the self-same note-hole of a *vansa*, a note and also its *dvigunah i.e.* upper octave note, and other notes, Kallinâtha has said "तत्स्वरो द्विगुणो भवेदिति फूत्कारेण प्रयत्नविशेष उक्तः (*i.e.*) that *svara* (by skilful blowing) would be *dvigunah* in this manner (*i.e.* as said in above mentioned S.R. text), particular (*i.e.* twice) the effort by blowing is spoken of" (*ibid.* S.R. VI, 453-56 Commt.). Sômanâtha speaking, no doubt following from S.R., of the upper octave note being *dvigunah*, has explained the same as, "द्विगुणप्रयत्नसाध्यः (*i.e.*) practicable by twice the effort" (*vide* R.V. I, 21, and Commt.). These explanations of Kallinâtha and Sômanâtha may be said to be near approaches to scientific units, for that ratio.

SVARA

In above, and previously, I have used note or tone, for the Sanskrit musical term *svara*, but that *svara*, as shown below, signified a note having particular properties. Sârangadeva has defined *Svara* as,—"श्रुत्यनन्तरभावी यः स्निग्धोऽनुरणनात्मकः। स्वतो रञ्जयति श्रोतृचित्तं स स्वर उच्यते (*i.e.*) that (sound which) being (*i.e.* sounding) in close proximity with (or simultaneous with) *sruti* (*i.e.* the sound of the alloted *sruti i.e.* of its definite pitch, is) *snigdha* (*i.e.* not harsh and fairly audible from a distance, vide S.R. III, 73, and is) *anuranandtmakah* (*i.e.* possessed with the natural characteristics of *anuranana i.e.* of resonance, including harmonic sound),* (and) which of itself (*i.e.* not even helped by other sounds) causes to entertain the heart of the audience, is termed *Svara* (स्वर) (S.R. Cal. I, ii, 23, *s.c.* Poona, I, iii, 26). In commentary to this, Sinhabhupâla says,—"श्रुतेरनन्तरं भवतीति श्रुत्यनन्तरभावी। प्रथमतन्त्र्यामाहतायं यो ध्वनिः रणनं शून्ये उत्पद्यते सा श्रुतिः। यस्तु ततोऽनन्तरं अनुरणनरूपः श्रूयते स स्वरः।···स्वतः अन्यानपेक्षया। यस्मात् श्रोतृचित्तं रञ्जयति तस्मात् स स्वरः इति निरुक्तिः। (*i.e.*) Does be *anantara* (*i.e.* in close proximity or simultaneous) of *sruti*, so (be the meaning of) *srutyanantara-bhâvi* (of above S.R. text). In the struck, chief or principal string, which (or that may mean,—in the struck string, which first or chief) *dhanih* (*i.e.*) *rananan* (*i.e.* sound), attains (or grows) in space, that (is) *sruti*, but which, in close proximity (or unseparated or simultaneous) with that (*sruti* sound), of property (or having as its nature and characteristics) of resonance, is heard, (is) *Svara* ...*Svatah* (*i.e.*) by independence of other (sounds). Through which, causes to please (or to entertain) the heart of the audience, therefore that (is) *svara*, such is the etymology (*i.e.* the etymological meaning of *svara*)". (*ibid.* S.R. Cal. I, ii, 23 commt.). From above, and from similar explanation of *sruti* in S.R. Poona, I, iii, 8 Commt. it appears, that this *sruti*, signified the definite pitch sound, heard at first, unornamented by resonance. Thus, a loud, pleasant or sweet, and resounding *sruti* sound, *i.e.* note-sound, was **Svara**. From above, it follows that *Svara* was composed of the following elements,—(1) *sruti* sound. From the distribution of *svaras* (previously termed by me as notes) in 22 *srutis* as spoken of by Sârangadeva, and the meaning and significance of *srutis* of these *svaras*, as shown by me before, and from the fact that there were no artificial or tempered notes in ancient Indian systems, it may easily be assumed that the above *sruti*-sound signified a sound of a particular pitch relatively naturally related with such sounds of other *svaras*, *i.e.* a sound of the pitch of a just natural, and not artificial note. From the significance of *srutis* of ancient *svaras* as spoken of before, it would be seen that above relatively natural relations of these sounds need not be assumed to have been confined to the ratios formed of the units 2, 3

*The meaning of *anuranandtmakah* as given in *ibid.* S.R. Poona, I, iii, 26 is अनुस्वाररूपः, which reading of which word is clearly an error, and the correct reading of which obviously would be अनुस्वानरूपः *i.e.* possessed of the natural characteristics of echo. Literally *ranana* means, sonorous property *i.e.* sound, and *anuranana* means sound following sound *i.e.* echo. That, in above text *anuranana* signified resonance, including harmonic sounds, would appear from S.R. Cal., I, ii, 23 Commt. quoted and explained above, and from S.R. Poona I, iii, 13-16 Commt., and also from that word *anuranana* explained in S.R. Poona I, iii, 24 Commt., as दृग्दाहृत जयघण्टानुरणनशब्दवत् (*i.e.*) like the *anuranana* sound of (a) *Jayaghantâ* (*i.e.* of a large, circular, flat, metallic bell, vide S.R. VI, 1192-93) beaten or struck with its rod (or hammer).

and 5, as of European just natural notes, as shown before by me, but these, it may be assumed, might, for some ancient *svaras*, have included, other such ratios of relatively naturally related pitches of sounds. (2) *Snigdha i.e.* as spoken above, not harsh *i.e.* pleasant or sweet, and fairly heard from a distance. Now, in vocal or instrumental music, however sweet, simultaneously with its sweet sounds, some harsh sounds or noises are produced *e.g.* in stringed instruments by friction through contact of the plectrum or bow, with the string. That music is termed sweet, in which these harsh sounds are not prominently audible from a little distance, but of that music, these harsh sounds can be recognised by musically delicate ears, closely placed, and also ordinarily, when mechanically magnified *e.g.* by gramophone horns, loud speakers &c.. Thus, it would be seen, that the above *snigdha* implied, such sounds of which the sweet or pleasant elements only were, and the harsh elements were not, fairly audible from a distance. (3) having *anuranana* property *i.e.* resonant. That these elements of *svara*, besides being a note, were of importance, would appear from the following.

GITA

Sârangadeva has defined *gita* as, "रञ्जकः स्वरसंदर्भो गीतमित्यभिधीयते (*i.e.* a) pleasing (or agreeable or entertaining or pleasant) group of *svaras* is termed as *gita* (S.R. IV, verse 1). Previously at p. 35 notes) by using note or tone for above *svara* I have also quoted and explained this S.R. text. Kallinâtha, in his Commts. in connection with above, has said, that *svaras* could be produced vocally, and also from *vinâs i.e.* stringed instruments and *vansas i.e.* flutes, and that though *svara* was of itself sweet, yet in their groupings some groups might or might not be pleasing, and that, hence, pleasing group of *svaras*, has been spoken of in above text. From description of *gitas* in S.R. and in S.R. Poona, Chs. VI, and VII, of instrumental music, and of vocal and instrumental music parties, accompanying vocal music and also dancing, it appears that ancient, both vocal and instrumental music were generally melodic, but also included simultaneous production of *svaras* from different instruments and voices, including different *svaras*, produced by simultaneously striking different strings, as is also found to be in practice in modern times, in India. Thus, generally melodic, but also including simultaneously produced, groups, as spoken above, of vocally or instrumentally performed *svaras*, was **GITA** (गीत). Thus, *Svaras*, and performance in group formation of these, being pleasant, were the constituent elements of *gita*. That group formation, might or might not be in any *Tâl* or in any rhythm, and a particular performed music of a Râga &c., might or might not, as spoken of before (at p. 35 notes) begin or end with the initial or final parts of the *gita*-group of that Râga &c.. Though the above few only, are the necessary elements, to be a *gita*, yet, as I shall show next, most of modern music is not *gita*, and on that account, are sources of much harm.

Most of modern music, not GITA. Gramophone, Talkie &c. music, even if we overlook their other defects, of which I shall speak next, do become monotonous and unpleasant after a few repetitions and so can not then be termed *gita*. To be a *gita*, besides being pleasant, it must be composed of *svaras*, and to be a *svara* it should have the three component elements mentioned above. Now, in modern times, high class Indian singers generally get their training and do practise and sing, with *tamburâ* accompaniment, due to which, as spoken of before (at pp. 8, 31 &c.) though they may attain high efficiency in pitches of notes and of other sounds, yet, their voices become jarring and harsh. Hence, however skilful and able artists they may be, their songs are deficient in above mentioned (2) *snigdha* element of *svara*. Ordinarily, as spoken of before, nowadays in India, especially in Bengal, singers are taught, and they practise and sing with, generally harsh sounding harmonium accompaniment, due to which, as spoken of before (at pp. 31, 115-116 and notes, &c.) their notes become generally artificial or unnatural and their veices become harsh. Hence their songs are wanting in the above mentioned elements (1) *sruti*-sounds, and (2) *snigdha*, of *svara*. European clarionet, flute, piccolo, cornet, horn &c. and frets of guitar, mandoline and other fretted instruments are tuned more or less to artificial notes, hence, music of, or accompaniment with, such instruments are wanting in above (1) *sruti*-sounds, unless that defect of artificial notes

of theirs, be remedied by skilful blowing or playing, as is found to be done, in very rare cases, by able musicians, by the processes spoken of before (at pp. 92 notes, 95-96 and notes &c.). Harmonium even if not harsh-sounding, and piano music or accompaniment, due to their artificial tempered or unnatural notes, are wanting in above (1) *sruti* element. Gramophone and such other Talking machine, Talkie bioscope, and Radio, music, and also music transmitted through loud speakers and such other mechanical devices, even in cases of their original music, which they reproduce or carry through, being sweet and not composed of artificial notes, do magnify and make loud, the sweet sounds, and therewith also the originally scarcely perceptible harsh sounds, as spoken of before, of that original music, and thereby make these harsh sounds distinctly heard from a distance, and besides that, they also loudly produce more or less, other additional mechanical and instrumental harsh sounds and noises of their own. Hence such music is wanting in abovementioned element, (2) *Snigdha*. Besides the above defect of Radio or wireless music, for proper transmission of it, from the sending station, and for being properly heard from its reproducing or listening-in machines, the original music of it, has to be, and is, produced within a room, whose floor and ceiling are covered with, and whose walls, doors &c. are plastered with, materials, resisting outside sounds and inside resonance. Hence, there is very little resonance in notes &c. of that music, and so, that Radio music is wanting in abovementioned element (3) *anuranana i.e.* resonance, of *svara*. The above kinds of music, which only, are generally to be met with nowadays in India, especially in towns, and that especially in Bengal, cannot be said to be *gita*. At most, these are deficient *gitas*. It is in very rare cases only, that music, even simple and unsophisticated music which can be termed real abovementioned *gita*, is now heard in India, especially in Bengal. That which do fall within the category of abovespoken *gita*, may still be met with, in the folk songs of some localities, very remote from, and from the baneful influences of, the abovementioned music of, towns. Music which is *gita*, even if so simple as the abovementioned folk-songs, should only be cultured and encouraged, and that music which is not *gita* should be eschewed, not only by musicians, whether pupils or advanced, but also by the audience generally, as, not to speak of their defects in the matter of entertaining, such music is positively harmful, as I shall speak of next.

Theory of music-sensation, European and Indian. In European theory, the sensations of sound are attained in some parts of the convolutions of the brain, being transmitted there, through nerves, from the vibrating ear-drum, and there are different theories about how, and through what particularly seated nerves within the inner ear, sensations of sound, including those of pitches, are so transmitted. In that theory, the theoretical particular parts of the brain, in which such and other mental sensations are said to be attained, have not yet been thoroughly specified. Sârangadeva in S.R, Poona, I, ii and iii, *s c.* Cal. I, i and ii, has narrated in very concise, simple, beautiful and explicit Sanskrit, the ancient Indian theory of sound, and of musical sounds and sensations of the same, by tracing these from the Indian theory of creation to the same theory of the transmission and propagation of the soul and life, and the growth and development of human body, and of the mental and spiritual sensations within that body, before and after birth. He has narrated in that connection, the anatomy and physiology of the human body, including those of its bones, muscles, heart, lungs, stomach, liver, spleen, kidneys, binding tissues of muscles, arteries, veins, glands of various secretions, brain, nerves, hair, different sorts and numbers of *Nâdis* &c, and of the functions of these, in accordance with that ancient theory. The explanations of these S.R. texts are more clear in S.R. Cal., commt., than in S.R. Poona commt. to these texts. Besides other special terms for arteries, veins &c., the abovementioned term *Nâdi* (नाड़ी), included, as would appear from abovementioned descriptions by Sârangadeva, arteries, veins, nerves and other tissues including motor tissues and tissues of secretion. For example, he has spoken therein, of the child in the womb being nourished with liquid juices of the mother carried through *Nâdis*, and he has also spoken of sensations of sounds and of other mental sensations being through some particular *Nâdis*, in particular parts of the body. According to ancient Indian theory, the seats of such sensations were not only in the convolutions of the brain (which for that purpose was termed *Sahasrâra*, which lit. meant 'thousand spokes, or petals'), but also in the convolutions of *Nâdis* in other specified parts of the body, and in that

theory, these convolutions in the brain and other parts, were also spoken of as seats of mental emotions, and also, seats and focuses of, spiritual sensations and of some forms of spiritual culture. That theory also speaks of particular names and numbers of these *Nâdis*, and the petal-like parts in their convolutions, and the numbers and colours of the petal like parts of each. Sârangadeva, in abovementioned texts, has briefly detailed with their names, the theory of the principal ones of the abovementioned convolutions, and of *Nâdis* thereof, and of the numbers and colours of the petal-like parts, of those having such parts, and of their positions in particular specified parts of the body, *e.g.* within the brain,—at different parts beneath the crown of the head, and behind the middle of the eyebrows, within the spine,—at behind the seat of the neck, and at behind, the heart, navel, &c., and within the body at its other parts, and he has narrated in that connection, theory of the particular main mental sensations and emotions, such as sensations of touch, smell, of *gita*, of delight, bliss, cruelty, disdain, thirst, hope, love, affection, remorse, &c., of which, the particular specific convolutions and particular petals are seats of, and of the functions, of some of these convolutions as seats and focuses of spiritual sensations and spiritual culture. For being ancient Indian, and not bearing the stamp of Europe, these Indian theories should not be looked down upon, as even Europe may still learn much from ancient Indian culture, which these theories are parts of*. In above connection, regarding musical sounds, Sârangadeva has said,—that, in the region of the heart, there are 22 *Nâdis*, attached transeversely to *Urdhvanâdi*, (ऊर्ध्वनाड़ी) and that, in these (22 *Nâdis*), being beaten by air, generate so many (*i.e.* 22) *srutis* (S. R. Poona I, iii, 8-9). From what has been spoken of before, it would be seen that these *srutis* signified pitches. In *ibid.* commt., Kallinâtha, has explained above (22) *Nâdis*, as सच्छिद्रनलिकाः *i.e.* porous stalks or stems *i.e.* tubes, and above *Urdhvanâdi* as the two *Nâdis* named *Idâ* and *Pingalâ*. Singhabhupâla in *s.c.* S. R. Cal., I, ii, 8-9, has explained that *Urdhvanâdi*, as the *Nâdi* named *Sushumnâ*. In Indian theory, all these three *Nâdis*,—*Idâ Pingalâ* and *Sushumnâ*, with having their intertwinings in the regions of most of the convolutions, spoken of before, of *Nâdis*, rise from near the seat of the human body, through within the spine, to the brain. Speaking above, as, regarding 22 *srutis* of lower *saptaka*, Sârangadeva, in *ibid.* 10 has said that, thus also be 22 *srutis* (of middle *saptaka*) in the neck, and 22 *srutis* (of upper *saptaka*) in the head. Those that may object to this theory, of sound being generated in other parts of the body, besides the throat and mouth, I may say that, feeling by seing and touching the chest, head, navel &c., besides the mouth and throat, the deaf and dumb learn to articulate and by that process they are taught to articulate, various vowel and consonant sounds. Thus the former parts of the body also, have, no doubt, functions and connections in the generation of various sorts of sound. Relating to *gita* &c. *i.e. gita, vâdya* (*i.e.* instrumental music), and *Nritya i.e.* dancing, Sârangadeva (in abovementioned S. R. Poona, I. ii) has narrated the ancient Indian theory about, which specific petal like parts, at which convolutions of *Nâdis*, in which particular parts of the body, as seats, are propitious, to the fulfilment of, and which specified ones as seats, are destructive of, *gita* &c. and of the rest he has said, that these as seats, never bring in fulfilment of *i.e.* (as spoken of by Sinhabhupâla, in S. R. Cal. I. i, 139 commt.) these as seats are उदासीन *i. e.* indifferent or neutral, to *gita* &c..

Benefits of GITA music. Besides of its entertaining properties, the beneficial and ennobling influences of music, have been highly extolled in English poetry and also in Sanskrit poetry and Sanskrit books on music. In such Sanskrit poetry and books, however, such has been spoken of, with regard to *gita*, for which term '*gita*', I have here and previously, used the term 'music', and 'the high aim of music of India' that I mentioned before (at p. 132), has been so spoken of in such books, with regard to *gita*. Sârangadeva, in very beautiful language, has spoken of such qualities of *gita*, in S. R. Poona I, i, 24-30, and by tracing from the Indian theory of creation, in *ibid.* I, ii, and iii, he, in *ibid.* I, ii, 1-3, 163-167; iii, 1-6 has spoken of the highly efficacious influence of *gita*, as a means for attaining both temporal and spiritual advancement. By accepting either of the abovementioned European or Indian theories of music-sensation, it would be seen, that that music which is *gita*, *i.e.* composed of such sounds as are natural (and not artificial or

* This may also be spoken of with regard to the theory of production of vocal sounds, as narrated (by accepting European theory only on these) by the author, in Gita Sutra Sar Vol. I (in Bengali).

tempered), agreeable and congenial to the human body, bodily senses, and the mind, that only, by stimulating and harmoniously developing, the auditory nerves through which, and the parts of the brain in which, according to above European theory, music-sensations are attained, or, the *Nâdis*, convolutions of *Nâdis* and petal-like parts of these, which, according to abovementioned Indian theory, are propitious to *gita*, can attain the abovementioned beneficial effects, including spiritual benefits, spiritual culture and spiritual development, as spoken of in abovementioned Indian theory. Besides above beneficial effects on individuals, *gita* or *gita*-music, especially good and high class ones, have a cementing, uniting, and harmonising influence on different individuals, in the family, society, and of different nationalities. Non-*gita* music, on the other hand, and also music and songs which attract to bodily senses would have the contrary effect, and of that I shall speak hereafter.

Regarding the **highly spiritual influence** possible **from GITA,** I have learnt the following from Dandisvâmi Visva Pranava Asrama, who is a *sanyâsi* (1), originally initiated from, and a student disciple of Sankarâchârya Math of Sringeri, in Southern India,—

A *gita* singer, should first of all be in *Brahmacharya* (2), and be truthful and devoted to Him. A man of this type, when sings *gita*, with devotion, then, there arises, a pure devotional, and sympathetic vibration within his backbone, in four *Nâdis,—Ida, Pingalâ, Sushumnâ*, and *Chitrâ*, unseen and unknown to ordinary human beings, but perceived and known to *Yôgis* only, who, through *Yôga* (3) or spiritual culture, have developed the thrilling sensations of the three *Nâdis,—Idâ, Pingalâ*, and *Sushumnâ*, by the method of *Satya-sâmya* (सत्यसाम्य) or *Samâdhi-sâmya* (समाधिसाम्य) (4).

The thrilling sensations of, and in, the three *Nâdis*, mentioned above, through above process, are means, (amongst other means by other processes of spiritual culture) through which, the veil, formed by attachment to the body, bodily feelings, senses and desires, and to objects of, and concerning these, [by which, clouds and mists, as spoken of before by me (at p. 132), being thrown, a human being, loosing his consciousness of the Soul within, becomes cognisant and concerned with that mere body and these feelings &c. of it only, as all in all], is gradually lifted, and thereby, by throwing broad, bright, brilliant light and lustre, awakens one's consciousness, of the eternal, all-powerful, all-pervading, Soul within, and of the non-lasting nature of the mere body and bodily feelings &c., and thereby he attains supreme bliss.

Injury from Non-GITA music. By accepting the abovementioned European theory, it would be apparent, that non-*gita* music, being not natural (*e. g.* composed of artificial or tempered sounds), or agreeable, or congenial to the human body, senses, and the mind, such as those mostly prevalent in modern times, as spoken of before, if heard often or constantly, by not properly stimulating and so not harmoniously developing, the proper auditory nerves and music-sensation-parts of the brain, but devoloping these inharmoniously, would have an injurious effect on the nerves, and so, on the body and the mind, and through these, on the health and morals also. If we accept the abovementioned Indian theory, it would be seen that such non-*gita* or defective or deficient *gita*, so heard often or constantly, by not stimulating or harmoniously developing the *Nâdis*, convolutions of *Nâdis* and petal like parts of these, which, as seats are propitious to *gita*, and by stimulating those of these, which as seats are destructive of, or are indifferent to, *gita*, would not develop harmoniously these *Nâdis* and their petals, but would disturb their proper equilibrium and harmony, and so, such **non-GITA** would **not only be injurious to** the **body, health, mind,** and morals, **but also to the spirituality** and to the spiritual development and spiritual culture of humans. In addition to this, such non-*gita* music, and also music kindling desires of bodily senses, not to speak of not having a uniting and harmonising influence, would actually have, as would be found if observed a little keenly, from the effects of the non-*gita* music, and the other kinds of music and songs, which mostly are practically met with, nowadays, positive disruptive and disuniting influences on individuals, of a family, or of a society, and also of different nationalities.

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(1) Such a *Sanyâsi*, has, besides other duties, to renounce the world and worldly attachments. (2) To be in *Brahmacharya*, mentioned above, one, besides other duties, should be in mental and moral discipline, and pure in body, mind, thought and acts, and should have control over his senses. (3) *Yôga*, spoken of above, includes amongst other duties, bodily, mental and moral discipline and practice of some mental and physical exercises, rites, and mortifications therefor. (4) *Satya-sâmya* or *Samâdhi-sâmya*, mentioned above, is a particular state of discipline, concentration, and equilibrium, attained, through one or other of the processes of spiritual exercise and culture.

GRAMA, MELA, THAT.

Hindusthani Grama and THAT. Unlike several European scales, and ancient Indian different *grâmas*, in the Hindusthâni system there is only one *grâma*, called the natural or common *grâma*, consisting of 12 notes, of which, as spoken of before (at p. 80 and notes), the seven, sa, ri, ga, ma, pa, dha, ni, are *suddha*, and the five, ri-*kômal*, ga-*kômal*, *kari*-ma, dha-*kômal*, and ni-*kômal* are *vikrita*. The latter five are theoretically known as the *vikrita*, forms of ri, ga, ma, dha, ni respectively. Thus, there are no *vikrita* forms of sa and pa, and this was what was spoken of by, 'shadj and pancham may never become Vikrit,' before (at p. 17 notes). The above *grâma* is based on its initial note sa, and on the tuning on the basis of sa. *Thâts* of different Râgas, in this system, are formed, based on that *grâma*, either with all *suddha* or with some *suddha*, and some *vikrita* forms, of 7 or 6 or 5 (of above seven *suddha* notes) which are termed, as spoken of before (at pp. 13, 20 notes, 79-80 notes &c.), *Sampurna* (or *purna*), *Shâdava* (or *Khârava*), and *Audava Thâts* respectively. In some cases both the *suddha* and *vikrita* forms of a note, and in rare cases both such forms of two notes, are included in a *Thât*, and in such cases, such one or two notes are counted as 1 unit, for the above numbers 7, 6 or 5, of notes. Many Râgas may, and actually have, the same *Thât*, in this system, but from that it does not necessarily follow, that all the notes of such a same *Thât*, have the same pitches in these different Râgas, *e.g.* from my experiments, spoken of before (at pp. 125-127 notes), I have found that though the Râgas *Bhairavi* and *Asâvari* have the same *Thât*, yet, the notes ri-*kômal* and ga-*kômal* of that *Thât*, are slightly different in each of these Râgas. Similarly other *vikrita notes*, and in some cases some *suddha* notes also, though termed by the same names in their *Thâts*, do slightly differ in pitch (as spoken of before by me in *ibid.*) in some cases, in different Râgas. Sa is the *Kharaj* note, and the initial note, and the basis of tuning of, above *grâma* and of all its above-mentioned *Thâts*, and sa is not omitted in any of these *Thâts*. I have used before, the word mode for above *Thât*, but these *Thâts* are not exactly alike, as spoken of before by me (at p. 11 notes), ancient European modes. I have spoken before that the above *suddha* sa ri ga ma pa dha ni are the same as European just natural c, d, e, f, g, a, b notes, but the former seven are not absolutely fixed in pitch as spoken of before (at pp, 6 notes, 9 notes &c.), as the latter. The nearest equivalent to above *Kharaj*-note is key-note, and not considering the absolute pitch of c, I have spoken of before (*e. g.* at pp. 9 notes, 16, 65 &c.) that the prevalent **All THATS are in Key-c,** or that middle-sa is the key-note of all. By these **I meant, middle-sa to be the Kharaj note of all these** *Thâts*. The author of G. S. S., however, as spoken of before(by me at pp. 3-5, 15-16, 19 &c.), has used different keys *e.g.* key-c, key-d, key-e-flat &c., and also different *Moorchhanâs*, as equivalents of some of abovementioned Hindusthâni *Thâts*. In these he has not taken into consideration the absolute pitches of these C, D &c. and E-flat &c. notes, and has taken the Hindusthâni seven *suddha* notes sa ri ga ma pa dha ni, as equivalent to just natural c d e f g a b respectively, and by taking *kômal* and *kari*, as equivalent to flat and sharp, he has taken the Hindusthâni five *vikrita* notes ri-*kômal*, ga-*kômal*, *kari*-ma, dha-*kômal* and ni-*kômal*, as equivalent to d-flat, e-flat, f-sharp, a-flat and b-flat respectively. In the above sense, **I have used** before (*e, g.* at pp. 8, 9, 16, 19 &c.) **flat and sharp** signs **for KOMAL and KARI** respectively and *vice versa*, and **have** also **used** before, (*e. g.* at pp. 9, 11, 13, 14, 15 notes, 16 notes, 20 notes &c.) **for notes, sa ri ga &c.** and also **komal-ri, kari-ma, komal-dha &c.. of THATS, and within THATS,** the **notes c, d, e &c.** and also **d-flat, f-sharp, a-flat &c.,** respectively. In such cases these, c, d, e &c., d-flat &c. should not be considered to be equal-temperament notes, or to have absolutely fixed pitches, but (as spoken of before by me at pp. 6 notes, 9 notes &c.), to be equivalent to abovementioned sa, ri, ga &c., ri-*kômal* &c.. of variable pitch of the initial note, but, having just natural intervals, relatively fixed, between notes. For strictly terming, the latter sa, ri &c. should be used, for the former, c, d &c. in these and such other cases.

Mela, termed also *Thâta* (as spoken of before at p. 69 notes), comprised notes whether *suddha* or both *suddha* and *vikrita*, of Râgas, and a particular *Mela* included in it notes of *Sampurna*, as well as *Shâdava* and *Audava* Râgas, as spoken of before (by me at pp. 69 notes, 110-111 notes &c.) and in

that connection I have shown the difference between these *Melas*, and abovementioned modern *Thâts*. I have also said before (at p. 113), that sa, or any other note was not recognised as the key-note, or any key-note was not recognised in these *Melas*. As spoken of before, Râgas were classified by *Melas* in Sanskrit books on music of 16th to 17th centuries A.D..

Ancient Gramas in terms of modern notes I have spoken of before, that, modern Hindusthâni pa to dha, theoretically are 3 srutis, and that the Hindusthâni seven *suddha* notes are the same as European just natural notes, but pa to dha being 4 *srutis*, are theoretically spoken of. Overlooking, the minute distinction of pa to dha as of 3 or 4 *srutis*, modern Hindusthâni natural *grâma* would be equivalent to ancient *Rajani Moorchhanâ*, *i.e.* (as shown before at p. 83 notes) the 2nd *Moorchhanâ* of *Shadja-grâma*, and ancient *Shadja-grâma* would be equivalent to the ri-*moorchhanâ* of modern Hindusthâni notes (as described, as spoken of before by me at p. 19, 89 &c., by the author of G. S. S.) as follows :—In the following, I have shown an octave, *i.e.* 8 notes of each.

Hindusthâni natural *grâma* with its theoretical *srutis*—sa 4	ri 3	ga 2	ma 4	pa 4	dha 3	ni 2	*sa*		
Ancient *Rajani Moorchhanâ*, with *srutis*.....NI 4	sa 3	ri 2	ga 4	ma 4	pa 3	dha 2	ni		
Ancient *Shadja-grâma*, with *srutis*.....sa 3	ri 2	ga 4	ma 4	pa 3	dha 2	ni 4	*sa*		
G. S. S. ri-*moorchhanâ* of Hindusthâni notes.....ri 3	ga 2	ma 4	pa 4	dha 3	ni 2	*sa* 4	*ri*		

I have shown before (at pp. 14, 19 &c,) that the author of G. S. S. has spoken of above ri-*moorchhanâ*, to be similar to ancient European Anthentic Dorian Mode re mi fa sol la si do or DEFGABC. The above leads to the inference, that ancient Indian natural or *shadja-grâma*, was similar to above ancient Greek mode DEFGABC. We find from sanskrit books on music up to those of the 17th century A.D., that *shadja-grâma* was the natural *grâma* up to that period. From descriptions of ancient European Greek and Eccelesiastical modes, we also find that, of these modes, above DEFGABC was the first or initial mode, of ancient Europe and other modes, including the mode CDEFGAB were based thereon (vide Encyclopoedia Brittanica 9th edn. 1884, Article Music. pp. 80-81). In ancient India also, as shown by me before, all *grâmas* and *moorchhanâs*, were based on the initial or natural, *shadja-grâma*. This similarity of ancient European and Indian, initial mode and *grâma*, and the similarity, as spoken above, of modern European and Hindusthâni just natural scale and *grâma*, lead to the inference, that, with the advent of the modern European just natural scale CDEFGAB, into Hindusthân, to tally with that, in Hindusthân, the initial or natural *grâma* was changed from the ancient Indian *shadja-grâma*, to the modern Hindusthâni natural *grâma*, thereby changing the values in sequence of, but retaining the names of, the initial and consecutive notes, sa ri ga ma pa dha ni. Thus, it may be inferred, the modern Hindusthâni natural *grâma* became practically similar to the above European just natural CDEFGAB or, do re mi fa sol la si, and that though practically, as found by Sir William Jones and the author of G. S. S. (as spoken of before at p. 6 notes), and by me (as spoken of before at p. 127 notes) pa to dha of the former was the same as sol to la of the latter *i.e.* in terms of *srutis*, of interval of 3 *srutis*, yet pa to dha 4 *srutis*, of that modern Hindusthâni natural *grâma*, was, as shown above, theoretically spoken of, it may similarly be inferred, on account of the consecutive 3, 2, 4, 4, 3, 2, 4 *srutis* of ancient *shadja-grâma* being kept up in theory, between ri to upper sa of that modern Hindusthâni natural *grâma*. That modern Hindusthâni dha, to tune with, and in being tuned in strings on basis of, its initial note sa, does, as a matter of course be a just natural major sixth, above that sa, and so a minor interval, or 3 *srutis*, above its pa. In ancient *shadja-grâma*, on the other hand, its pa, to tune with, and to be tuned in strings on basis of, its initial note sa (of which modern ri is the equivalent) was naturally 13 *srutis i.e.* a just natural fifth above that sa, and similarly its ma was 9 *srutis* or a just natural fourth above that sa, and so from pa to dha of it, was 4 *srutis*. The modern Hindusthâni sa to ma and sa to pa being the same as, sa to ma and sa to pa of ancient *shadja-grâma*, respectively, from the sequences of *srutis* of the latter, it may be inferred, that the theory of pa to dha 4 *srutis*, of the former *grâma*, crept up. I have shown before, that in some Râgas, and in some practical music, dha is higher, so that pa to dha would be 4 *srutis*. That, in terms of *srutis* would be termed dha, one *sruti* higher, and in terms of degrees, mentioned before (at p. 22 notes), 1 degree higher than the natural Hindusthâni dha, mentioned above. The author in G. S. S. I, iv, 27 has also said,

that where dha is performed in relation to ri, and also in such music where *kari*-ma and pa are frequent, when, in such cases, dha is performed relatively to *kari*-ma and pa, then dha, to tune with such, ri, kari-ma or pa, is performed one degree higher. In modern English Tonic Sol-fa system also, as spoken of before (at p 22 notes), **la**, to agree with **re**, is performed 1 degree higher, which higher **la** in that system is termed **lay**. Similar to this, I term here, abovementioned 1 *sruti* or 1 degree higher dha as **dhay**. I have also shown before (in *ibid.* p. 22 notes), that in that English Tonic Sol-fa system, in practical performances, re to tune with fa or la, has to be and is practically performed 1 degree lower. That 1 degree lower re, in that system is termed rah (vide *Standard Course*, vi, p. 111). The author of G. S. S. has also said, that, in performing (modern Hindusthâni) ri, in relation to dha or ma, to tune with one or other of the latter, that ri has to be and is practically performed, 1 degree lower than natural Hindusthâni ri, mentioned above (vide G. S. S. I, iv, 27). The author has however, not assigned any especial names or signs for these 1 degree higher dha and 1 degree lower ri. That 1 degree, and also that 1 degree difference between abovementioned la and lay, is, in the terms of the European theory of 53 degrees in an octave, of which (as spoken before by me at pp. 22 notes, 29), neglecting small fractions, 9, 8, and 5 degrees, are the values of just natural major, minor, and semitone intervals respetively. With abovementioned term dhay and with *sruti* differences between ancient Indian and modern Hindusthâni notes, and with degrees differences between medern European notes, I give below, Tables of modern Hindusthâni *grâma* and ancient Indian *Shadja* and *Madhyama* grâmas, with equivalent modern notes. In these I have shown an octave (*i.e.* 8 notes) of each.

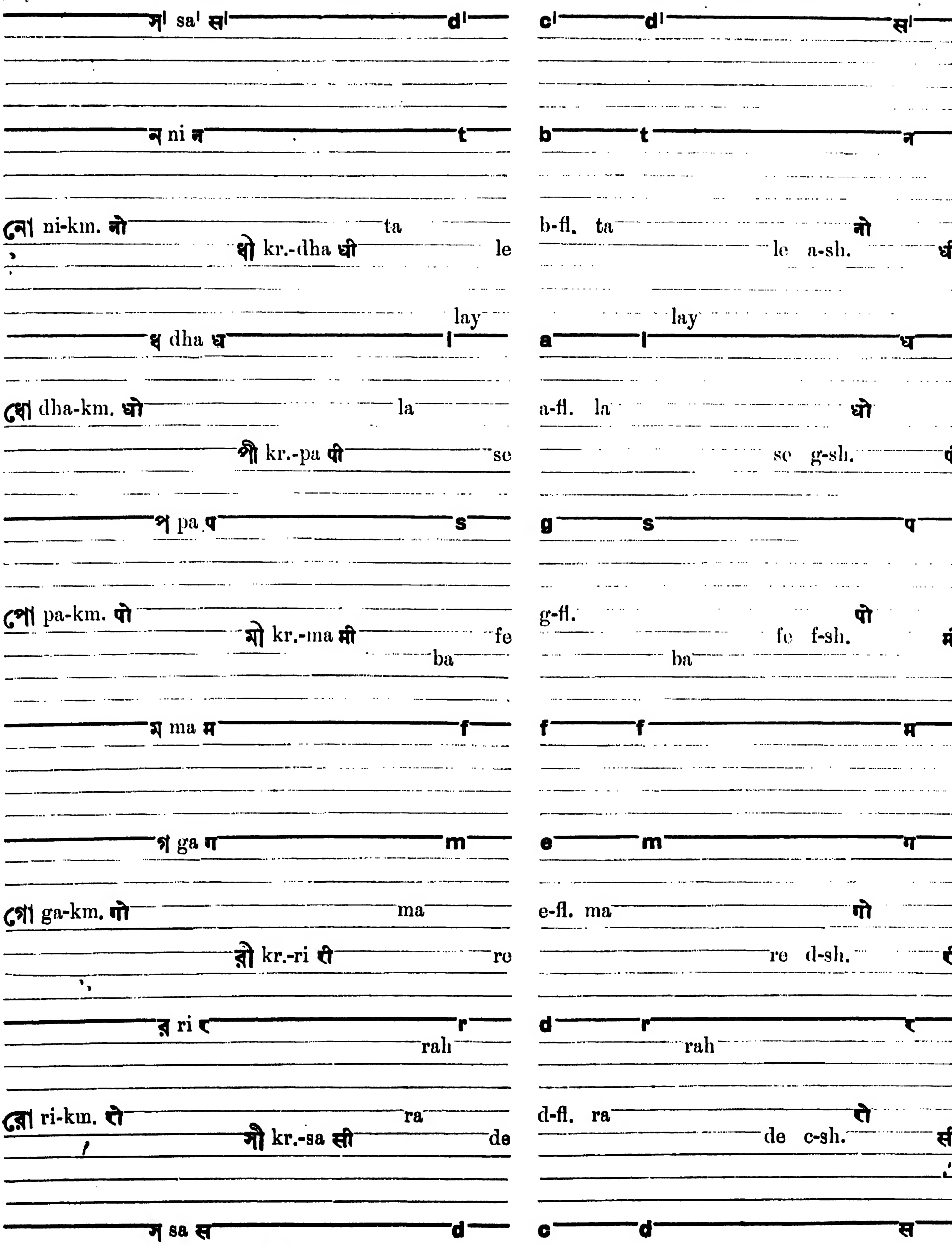
Modern Hindusthâni natural *grâma* with *srutis*...sa	4	ri	3	ga	2	ma	4	pa	3	dha	4	ni	2	*sa*
European notes with degrees.....do	9	re	8	mi	5	fa	9	sol	8	la	9	si	5	do′
Ancient *Shadja-grâma* with *srutis*.....sa	3	ri	2	ga	4	ma	4	pa	3	dha	2	ni	4	*sa*
Modern Hindusthâni notes with *srutis*.....ri	3	ga	2	ma	4	pa	4	dhay	3	ni	2	*sa*	4	*ri*
European notes with degrees.....re	8	mi	5	fa	9	sol	9	lay	8	si	5	do′	9	re′
Ancient *Madhyama-grâma* with *srutis*.....ma	3	*tri*-pa	4	dha	2	ni	4	*sa*	3	*ri*	2	*ga*	4	*ma*
Modern Hindusthâni notes with *srutis*.....pa	3	dha	4	ni	2	*sa*	4	*ri*	3	*ga*	2	*ma*	4	*pa*
European notes with degrees.....sol	8	la	9	si	5	do′	9	re′	8	mi′	5	fa′	9	sol′
Ancient *Gândhâra grâma* with *srutis*.....ga	3	ma	3	pa	3	dha	4	ni	3	*sa*	2	*ri*	4	*ga*
Particular places amongst 22 srutis, of each of these notes	10	13		16		19		1		4		6		10

The above *sruti* differences and positions of notes in particular ones of the 22 *srutis* of *Gândhâra grâma* are to be found from S. R. Cal. I, iii, 4-5 *s.c.* Poona I, iv, 4-5 and commts.. In that S. R. text it has also been said, that that *grâma* happens to be in use in the heavens. Now, by giving 9, 8, 5 degree values to 4, 3, 2 *srutis* respectively, of above *gândhâra grâma* notes, the total would exceed the octave of 53 degrees. Without mentioning this difficulty, and no doubt feeling this, Mr. Clements without giving any reason or proof for his values, has given and suggested different ratios for 3 *srutis* between different notes, as spoken of before by me (at p. 139), of this *grâma*. As this *Gândhâra-grâma* is spoken of in above text, to be of the heavens only, and not to be prevalent in the earth, we need not seek for our modern values of its notes.

The above would give an **Index to the transpositions of notes of Ancient GRAMAS, Notation, Sargam.** &c. as are to be found in Bharata's *Nâtya Sâstra, Brhaddesi, Sangita-Ratnâkar, Sangita-Pârijâta, Râga-Vibôdha* and other ancient sanskrit books on music,—to modern notes. In going to so transpose these to modern notes, the precautions necessary and the difficulties, spoken of by me before (at pp. 106, 107, 138-139) should however be always kept in view.

Theoretical Values of Notes used in Gita Sutra Sar.

In the diagram at next page, with a line for each degree, I have shown, in terms of 53 degrees in an octave, the Hindusthâni 7 *suddha* and 5 *vikrita*, and additional 5 *vikrita* (spoken of before at p. 138) notes, as used, and their values in theory, as accepted, by the author of G. S. S., together with their equivaient, and also other important, English Tonic Sol-fa notes.



In above, kr. and km. has been written for kari and kômal, and sh. and fl. have been written for sharp and flat, respectively.

In the diagram, I have given, besides the names in English of the Hindusthâni note signs, also their Bengali Tonic Sol-fa signs, as adopted and used by the author in both Vols. I and II of this Gita Sutra Sar, and also the corresponding Tonic Solfa signs in Devanagar characters, as used between pp. 101 to 116, of the music portion of this Part II of Vol. II, and I have also given in a seperate diagram the European notes considered, as having just natural intervals between them, as done in Gita Sutra Sar, as mentioned before, corresponding to abovementioned Hindusthâni, and their corresponding English, Tonic sol-fa notes, in key-c.

It should be remembered, however, that the values of the Hindusthâni notes as given here, are only as spoken of in G. S. S. I, iv, 26, by the author, their theoretical values (as accepted by the author in Gita Sutra Sar). In practical music, however, the values of these notes, as for example of ri and dha, as spoken of before, and of other notes also, *e.g.* of *kari*-sa, as spoken of by the author, in G. S. S. I, iv, 26, in relation to different key notes, in different keys, vary one degree more or less. Such minute distinctions, as the author says in *ibid.* are matters for theory, and mathematical calculations only, and not for practical music. In practice, besides these and such other notes being played one degree, higher or lower, as spoken above, to suit particular cases, these and other, both *suddha* and *vikrita* notes, have also, in practical music, to be performed with other slightly altered values as spoken of before by me (at p. 127 notes &c.).

In these diagrams, it would be seen, that, amongst the English Tonic Sol-fa notes, there is no flat (*i.e.* **sa**) note between **f** and **s**, corresponding to pa-*kômal*. That "flat between **f** and **s**", says The *Standard Course* (at VI, pp. 109-10) "theorists unanimously reject in favour of the sharpened **f** (fe)." As a matter of fact, such minute distinctions between such and other sharps and flats, are matters of theory only, as spoken of above. In practice, in Europe in writing music in English Tonic Sol-fa notation, such sharp notes or flat notes are written in some cases, one for the other, to suit the convenience of writing, and the author of G. S. S., in the music portion, whether in staff notation or in his adopted Bengali Tonic Sol-fa notation, has also in some cases, written the *vikrita* notes *kari*-sa, *kari*-ri, either as *kari*-sa, *kari*-ri &c., or as ri-*kômal*, ga-*kômal* &c., to suit the convenience of writing. To suit particular cases, notes, written as *kari*-sa &c., are to be performed in the values given here, of ri-*kômal* &c., and *vice versa*, and these, as well as some *suddha* notes also, would have to be performed, for proper practical performances, in other slightly altered gradations of pitches also, as spoken of before (at p. 127 notes &c.), varying slightly, and that differently in different cases, from their abovementioned theoretical values, to suit particular cases, or particular Râgas.

THE END OF TRANSLATOR'S EXPLANATIONS AND NOTES.

Berhampore, (Bengal)
District Murshidabad
September, 1941. A.D.

Himansu Sekhar Banerji
Translator.

GITA SUTRA SAR VOL.II, PART II.

Translator's Explanationsand Notes.

Errata and Corrigenda

Page	Line	for	Read.
9	12	Vikrits (acidentals) by	Vikrits by
11	2	Musics	Music
11	2 of Foot notes	Cosists	Consists
14	2 " "	Grandations	Gradations
15	13 " "	c, d, e♭, f, g	c, d, e♭, e, f, g
15	15 " "	c, d, f, g,	c, d, e♭, f, g,
15	15 " "	c, e♭, f, g, a♭,	c, e♭, f, a♭
15	16 " "	d is	d and g are
16	3 " "	c, e♭, f, g, a♭,	c, e♭, f, a♭,
16	4 " "	Hexatonic	Pentatonic
21	12-14 " "	In this sense..... .... European system.	Delete the whole sentence.
29	30	Sol, La, Si -	Sol, La, Si -
	2 of Foot Notes	are required different tensions	different tensions are required
31	2	Casily	Easily
33	4	[illegible]	[illegible]
	13	[illegible]	[illegible]
	Heading of 3rd staff	[illegible]	[illegible]
	Heading of 4th staff	[illegible]	[illegible]
34	35	[illegible]	[illegible]
35	5 of Foot notes	Comm.	Commt.
68	33 " "	Kshudraghuntika	Kshudraghantika
	" "	[illegible]	[illegible]
79	5 " "	[illegible]	[illegible]
81	16	Orc ontem-	Or contem -
	19 of Foot Notes	Aohbala	Ahobala
86	5 " "	14 15	14, 15
87	15 " "	[illegible]	[illegible]
143	21	[illegible]	[illegible]

GITA SUTRA SAR VOL.II PART II.

Translator's Explanations and Notes.

Errata and Corrigenda. (Contd.

Page.	Lin	fo	Read
88	3	Ectelsistical	Ecclesiastical
	7	Ghâts	Thâts
	8	of at pp.	(of at pp.
	4 of Foot notes	sadja	shadja
	7 " "	Jatis	Jâtis
	8 " "	Jatis	Jâtis
	31 " "	only suddha notes	only suddha i.e unaltered GRAMA NOTES
	33 " "	were as ... note only	were composed o: suddha i.e. unaltered GRAMA notes only
	35 " "	ot 6	of 6
	37 " "	moorchanâs	moorchhanâs
	40 " "	Sudha	Suddha
100	31 " "	Mdm, Gm.	Mdm. Gm.
	44 " "	of if Bhds.	of its Bhds.
139	3	wond	would
	56	3 2. 2:1	3:2 2:1

GITA SUTRA SAR VOL. II. PART II.

OSTADI SONGS.

Errata and Corrigenda.

Page	Line	for	Read.
69	last line	Komal-ri	Komal-ni. ni

NOTICE

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